

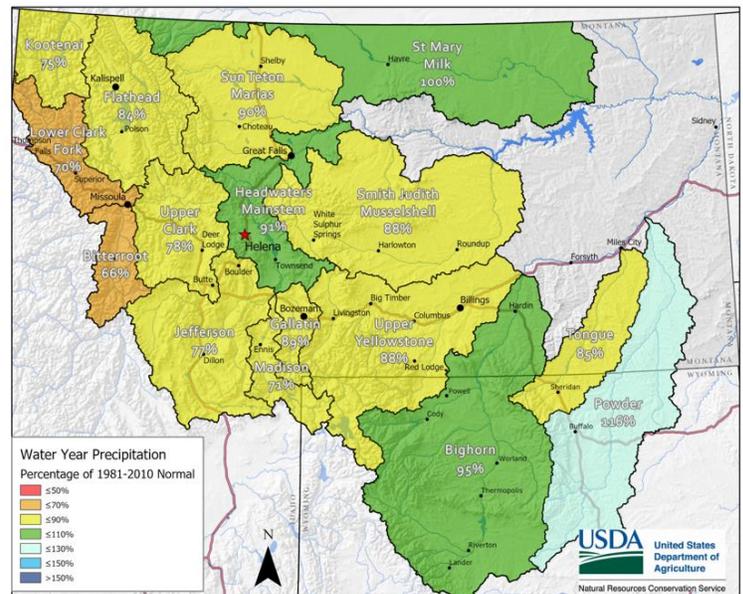
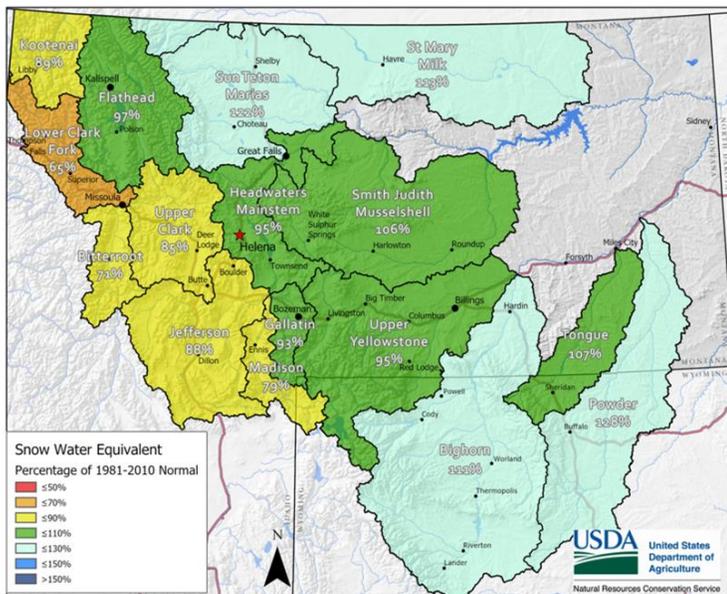
Montana

Water Supply Outlook Report

January 1st, 2020

January 1st, 2020 Snow Water Equivalent (SWE)

January 1st, 2020 Water Year Precipitation



What is the difference between Water Year Precipitation and Snowpack? It has been an interesting year so far weather-wise in the state of Montana, and a little bit of everything has been thrown our way. As of January 1st, there is a stark contrast between snowpack for this date and how much precipitation we have received since October 1st (beginning of Water Year 2020). While snowpack remains near or even above normal in some regions, those same areas have precipitation totals that are below normal for this date. Snow totals this year were boosted by early season snowfall in late September and October. However, the persistently dry conditions in November and early December resulted in well below average precipitation since then. It is best to think of these two data types like this; Water Year Precipitation is the total amount of water we have received in the form of rain and snow, and Snow Water Equivalent (or snowpack) is how much of that water has been stored as snow on the ground for runoff in the spring and summer. While snowpack may seem to be in good shape on January 1st in some regions, below-normal precipitation means there is a component in the hydrologic system that is lacking, which could potentially have impacts in the future if the deficits persist.

For more water supply and resource management information, contact:

Lucas Zukiewicz
Water Supply Specialist
Federal Building
10 East Babcock, Room 443
Bozeman, MT 59715
Phone 406-587-6843
lucas.zukiewicz@mt.usda.gov
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/>

Montana Water Supply Outlook Report as of January 1st, 2020

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

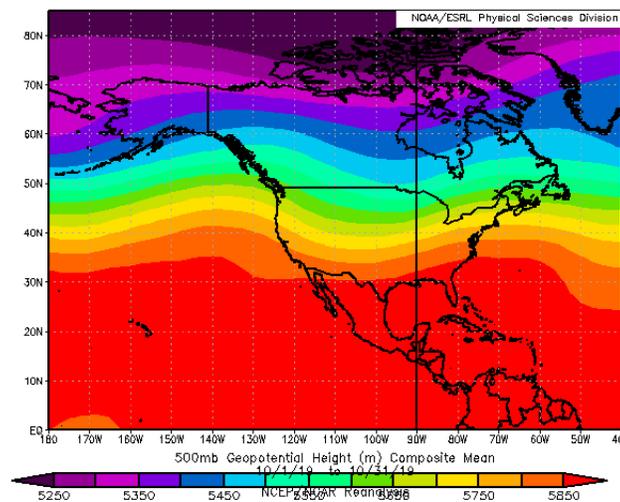
To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C., 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

Overview

Every year, the NRCS begins its publications of snowpack and water supply reports during the first week of January to give customers an idea of how conditions are shaping up so far this Water year. However, to better understand our current conditions, we need to take a look at the past since these antecedent conditions before the snowpack begins to accumulate help to shape and influence runoff this coming spring and summer.

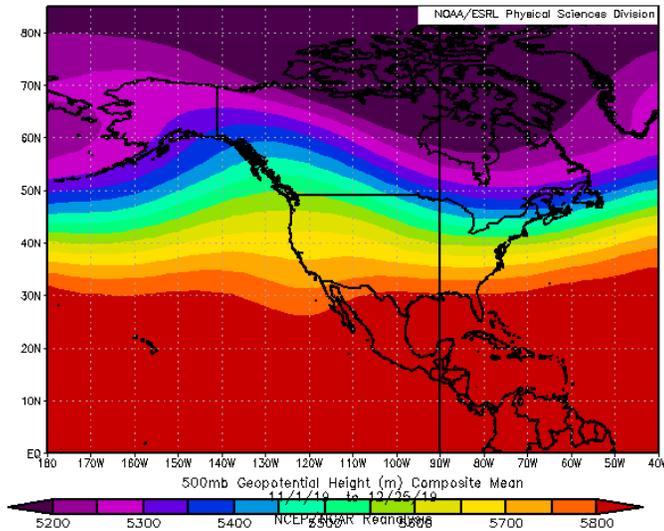
Volumetric Streamflows, or the total amount of water to pass through the river this past summer and fall, were near to above average across most of the state; however, [some rivers in the northwest experienced well below average flows](#) this past runoff season (April 1st to September 30th). As summer wrapped up, the back and forth dry and wet patterns of precipitation that dominated the June through August period gave way to a very wet weather pattern at the end of September. The 2019 water year finished with a bang, with some SNOTEL sites in the Rocky Mountain Front receiving up to 3.8 inches of [Snow Water Equivalent \(SWE\)](#) and up to 36 inches of Snow Depth between September 27th and September 30th. Prior to the storms that impacted the state, a prolonged dry spell had dropped little with regards to precipitation. The end of month storm boosted monthly totals and ultimately [resulted in new records for September precipitation](#) at many monitoring locations.

As the 2020 water year began, this pattern stayed in place with the upper-level flow from the west-northwest ushering in abundant moisture from the Rocky Mountain Front to the Beartooth Range, areas that are heavily favored by this type of flow pattern. Other regions across the state weren't as lucky, with areas in the northwest and eastern Montana experiencing below-average precipitation for the month. One thing was certain; October was cold. Overnight low temperatures on October 29th were in the teens below zero in many locations, setting new records for the daily minimum temperatures, and many cities [experienced their earliest day of subzero temperatures](#). The state-wide October average temperature would end up being the second-lowest on record.



Mean 500mb flow during the October 1st to October 31st time period. [This pattern favored states to the north with regards to precipitation.](#) (MT, WA, ID, WY and parts of CO).

Just as it seemed like Montana was again going to be the envy of the west snowfall wise, it became apparent that all good things must come to an end, and this pattern wouldn't stay in place for long. November and December precipitation was a disappointment in the western half of Montana, with many locations receiving [well below normal](#) to [record low precipitation](#) during the period. The last two months have been dominated a jet stream which has pushed pacific moisture to the south, leaving the mountains and valleys of the Pacific Northwest high and dry. The silver lining, if there is one, is that the flow patterns did allow for near to above-average precipitation in the eastern half of the state where water year to date precipitation is above normal.



Mean 500mb flow during the November 1st to December 25th time period. [This pattern favored states to the south with regards to precipitation](#) (CA, UT, CO, AZ, NM).

This year has been an interesting one so far, and the big picture weather patterns have resulted in interesting snowpack and precipitation totals. Some areas remain near to above normal for snowpack on January 1st, boosted from early season snowfall, while most snowpack monitoring sites west of the Divide have snowpack that is below normal for this date. Further details on water year precipitation and snowpack totals will be covered in the following sections.

The wet pattern currently in place from the end of December is helping to make up for some deficits in basin west of the Divide and [seven to ten-day forecasts](#) continue this pattern. Looking beyond that, the National Weather Service's Climate Prediction Center [one month forecast for January 2020](#) indicates better than normal chances of colder temperatures and increased chances of above normal precipitation. [Long-range forecasts for the January through March period](#) indicate equal chances for normal temperatures and higher probabilities for above-normal precipitation.

Changes to the Water Supply Outlook Report in Water Year 2020

To reduce the file size of the Snowpack and Water Supply Outlook Report, and streamline its delivery to customers, the maps provided by the [NRCS partnership with the Montana State Library](#) will not be included in the monthly publication. However, the partnership will continue, and the high-quality statewide and basin maps will remain available through their website. The water supply maps, archived maps, as well as other useful tools developed through this partnership can be found here:

http://geoinfo.msl.mt.gov/nrcs_partnership/climate_and_water_supply

Snowpack

When we discuss snowpack on January 1st, it's essential to do so within context of what it means. On January 1st, about 35 to 45 percent of the annual snowfall has already occurred, building the base for this year's snowpack, and setting up runoff during the spring and summer. What that means is that there is a lot of winter left for things to get better, or worse, and you don't have to look far back in history for some examples where that occurred. Take last year, for example. On January 1st, 2019, many of the river basins across the state had [snowpack that was below to well below normal](#). The significant pattern changes that occurred through the winter resulted in a very different looking snowpack as [peak accumulation approached](#). Aside from the northwest river basins, surface water was abundant and long-lasting. It can also go the other way. Looking back to the 2016 water year, January 1st, 2015, [the snowpack was near to above normal](#) in many river basins. By the time spring approached, the snowpack had experienced an [early and well below normal peak accumulation](#) at most sites. This resulted in [well below average streamflows](#) during the April through September period.

All of this goes to say this: Look at the January 1st snowpack totals more like a progress report than a report card. Yes, snowpack in some basins is below normal for this date this year, but there is time for it to improve before we give the snowpack an "F," and it gets grounded. Now, if it hasn't gotten its act together by April, then that's a different story.

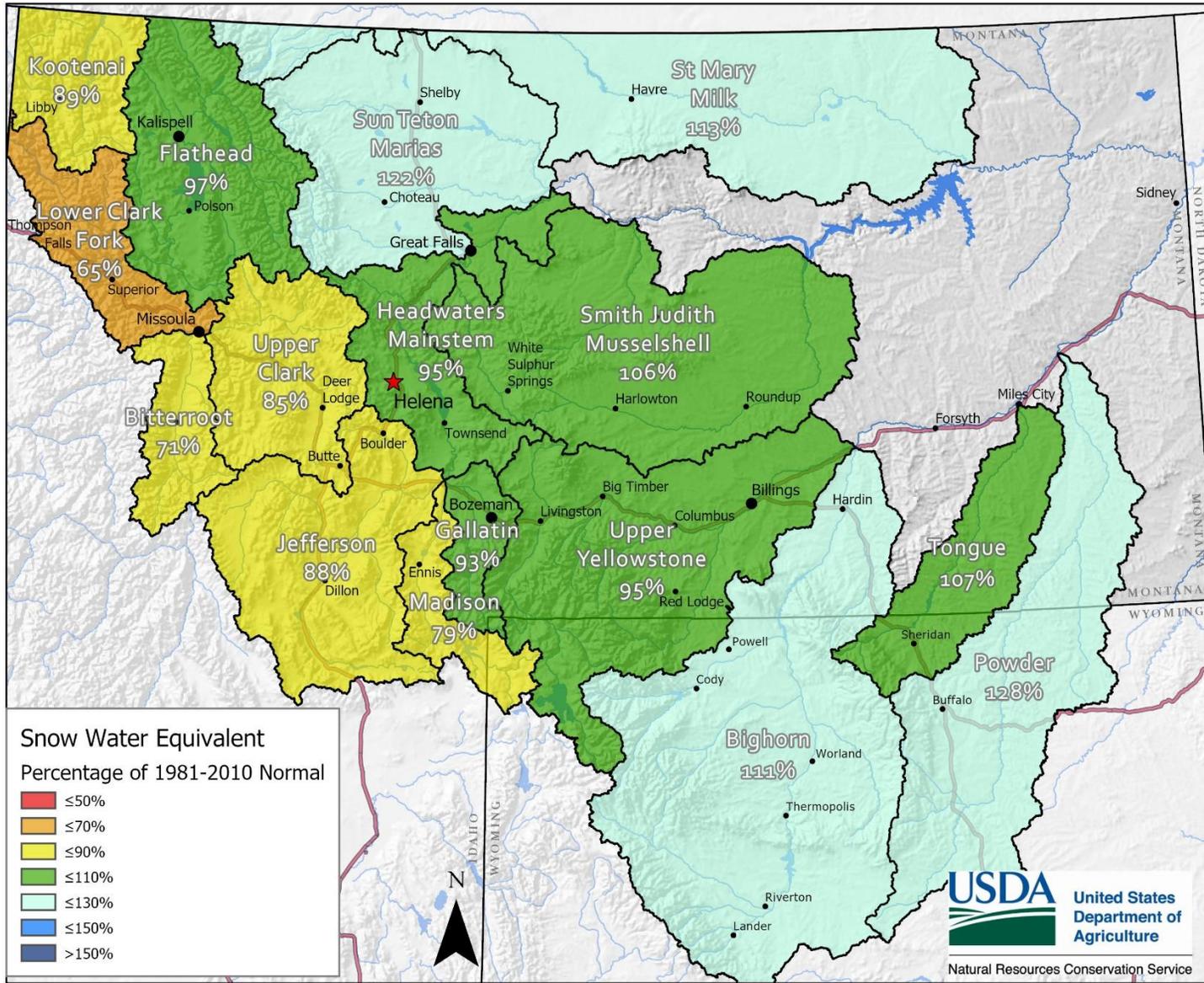
Anomalous early season snowfall blanketed the treasure state at the end of September. [Browning, MT received 48 inches of snow](#) at the end of September, and the high elevation Badger Pass SNOTEL site received 36 inches of snow, equaling 3.8 inches of Snow Water Equivalent (SWE). The snowfall would keep up under west-northwest flow during October with mountain ranges along and east of the Divide most favored. As November progressed, the storm frequency slowed down as a major pattern change in the jet stream moved moisture to the south of the state, resulting in below-normal precipitation and much warmer temperatures. Monitoring locations along and east of the Divide have snowpack that is near to slightly above normal for this date, in large part boosted by the abundant September and October storms. The areas that have mainly been left out so far this winter are basins west of the Divide and along the Idaho border. Snowpack totals in these basins have been below normal throughout the water year. Fortunately, before the calendar year ended, an ["atmospheric river" event](#) spilled into northwest Montana from the west coast, helping to increase snowpack percentages a bit before the holiday.

The storm that would begin impacting the state on the last day of the year would yield significant snowfall in basins west of the Divide. The storm would go on to last into the New Year, ending on January 2nd. Storm totals would stack up to over 4 inches of SWE in the southern Mission Range, and elsewhere totals ranged from 1.5 to 3 inches of added water to the snowpack. This storm, which crosses over time periods for this report, is not reported in full since the rest of the data for this report is for midnight on January 1st, 2020. To stay consistent with the reporting of manually measured snowcourses, which are measured during the last week of the month for January 1st, the additional totals are not reported here with regards to basin percentages. They will be summarized and discussed in next month's report. As the wet pattern continues into January, the totals look impressive. Statistically, January is one of the "biggest" months for snowfall in river basins west of the Divide, so hopefully, it can help to make up for the lackluster November and December.

Snow Water Equivalent

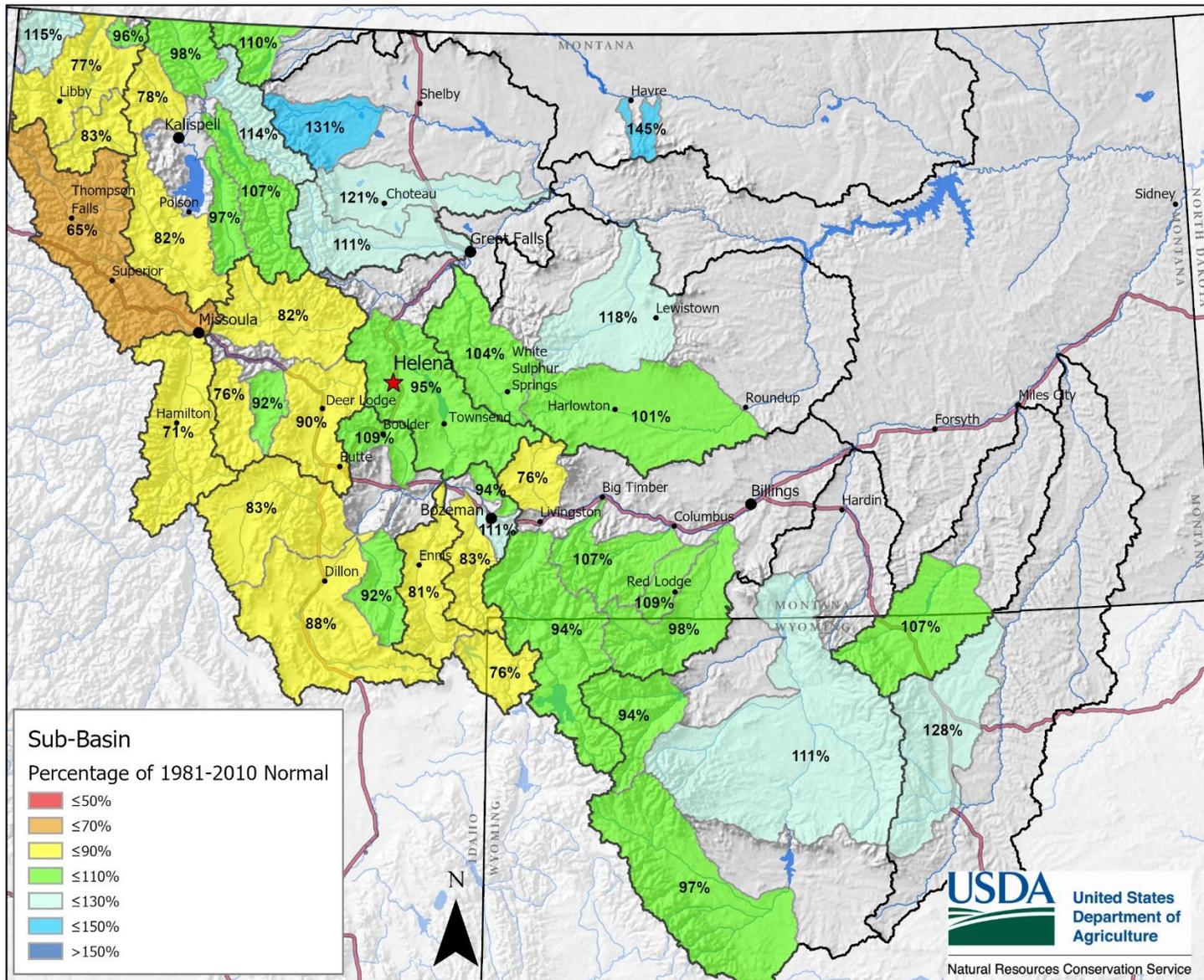
1/1/2020	<i>% Normal</i>	<i>% Last Year</i>
Columbia River Basin	85	92
Kootnenai in Montana	89	101
Flathead in Montana	97	111
Upper Clark Fork	85	90
Bitterroot	71	71
Lower Clark Fork	65	69
Missouri River Basin	93	108
Jefferson	88	101
Madison	79	103
Gallatin	93	86
Headwaters Mainstem	95	108
Smith-Judith-Musselshell	106	119
Sun-Teton-Marias	122	154
St. Mary-Milk	113	124
Yellowstone River Basin	101	107
Upper Yellowstone	95	99
Bighorn	111	111
Tongue	107	116
Powder	128	124
West of Divide	85	92
East of Divide	97	110
Montana State-Wide	89	100

Snow Water Equivalent - Percentage of 1981-2010 Normal January 1st, 2020



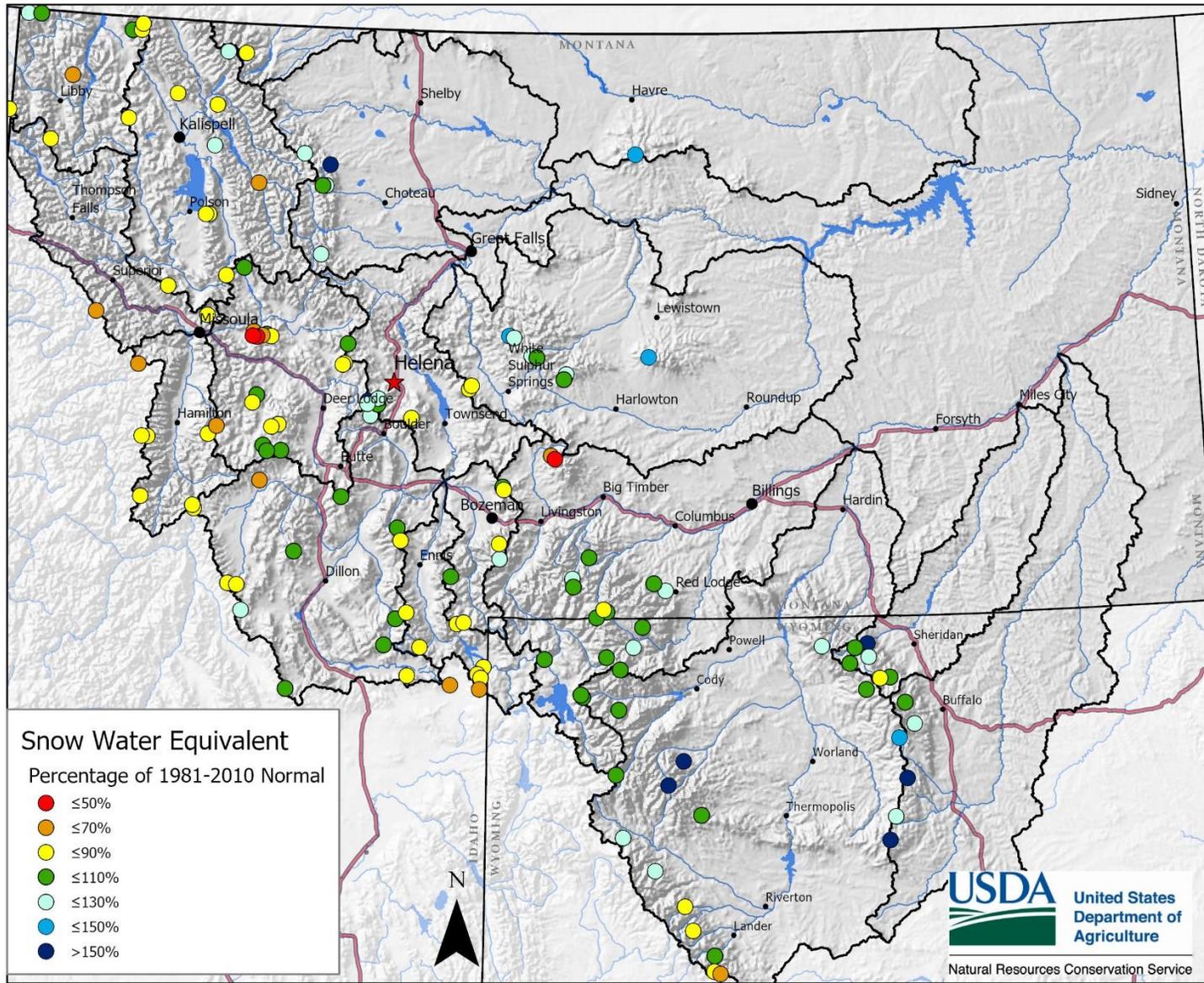
Created by the USDA-NRCS Montana Snow Survey Staff on: 1/8/2020

Snow Water Equivalent - Percentage of 1981-2010 Normal January 1st, 2020



Created by the USDA-NRCS Montana Snow Survey Staff on: 1/6/2020

Snow Water Equivalent - Percentage of 1981-2010 Normal January 1st, 2020



Created by the USDA-NRCS Montana Snow Survey Staff on: 1/6/2020

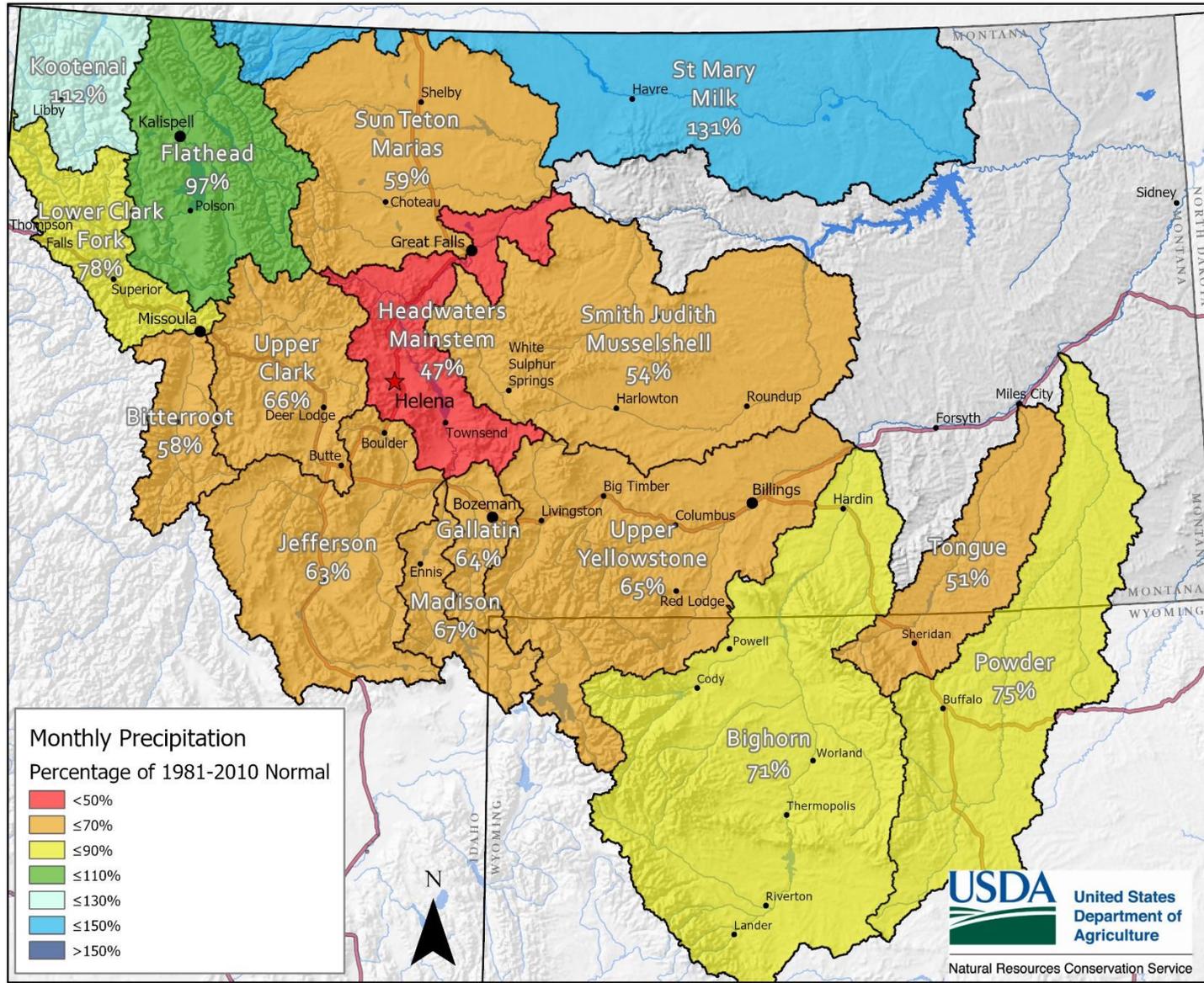
Precipitation - Overview

Like discussing the snowpack, you can break what has occurred this water year into two periods: late September and October, and the rest. After a significant blast of moisture early in the year, the change to drier weather patterns resulted in water year precipitation that is [below normal to well below normal in many parts of western Montana and the Pacific Northwest](#) in general. The significance of this is amplified in basins west of the Divide. Unlike basins east of the Divide, which receive the bulk of their annual moisture between March and June, the basins west of the Divide are frontloaded early in the water year, where their “biggest” precipitation months occur between November and February. The lack of moisture so far this year means that the coming months will be critical in making up for the deficits in this year’s water year precipitation. As of right now, they are not insurmountable deficits, but improving to near normal by runoff season becomes decreasingly likely if it doesn’t happen in the coming few months. Adding to this potential problem is the fact that [runoff in many northwest basins was well below average last summer](#), and long-term totals ([14-month precipitation totals](#)) show the dry conditions in the Kootenai and Lower Clark Fork River basins persist at a longer time scale. A pattern change would be more than welcome after the last two dry months in the western half of Montana.

Precipitation

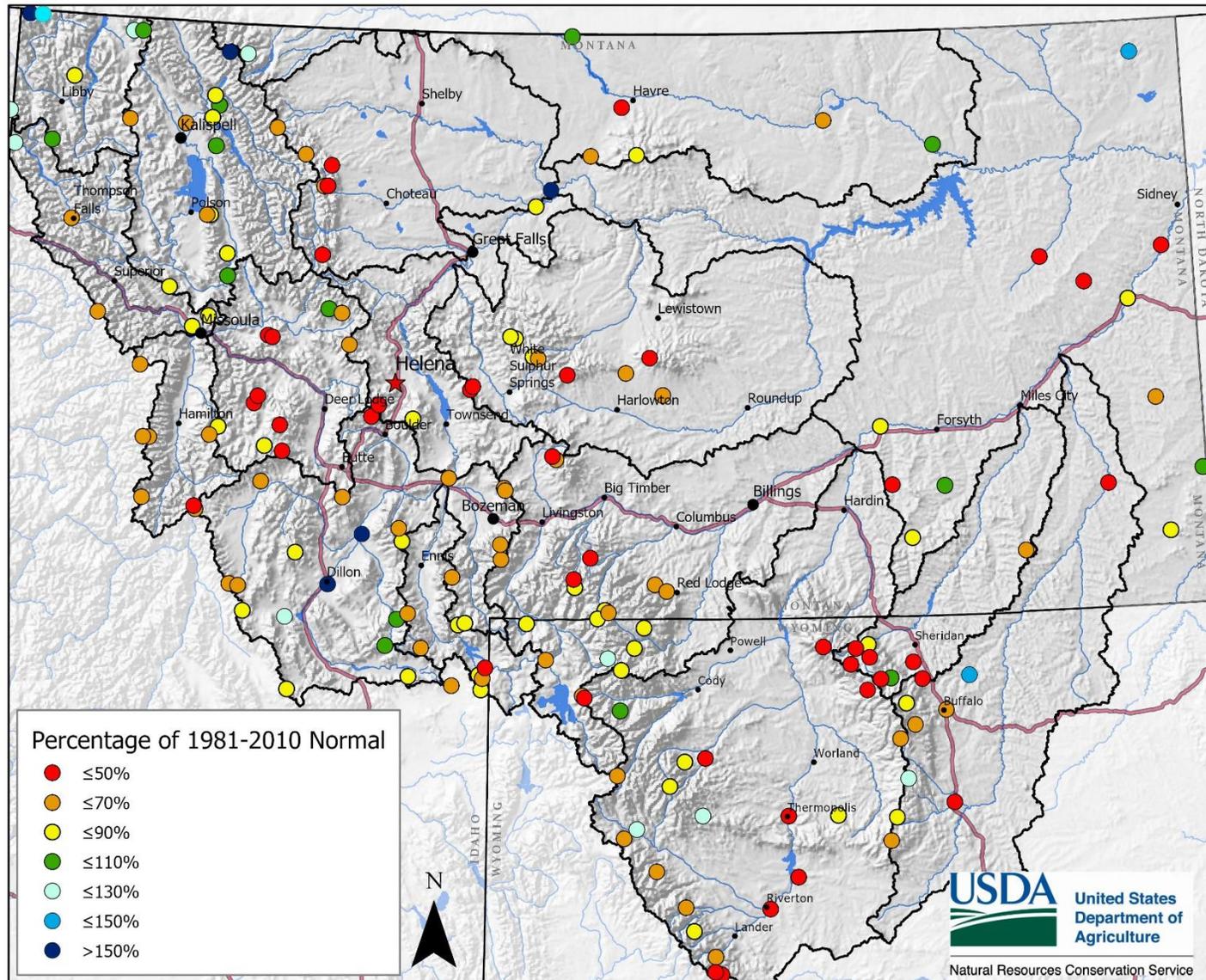
1/1/2020	<i>Monthly % Avg</i>	<i>Water Year % Avg</i>	<i>WY % Last Year</i>
Columbia River Basin	84	77	82
Kootenai in Montana	112	75	91
Flathead in Montana	97	84	89
Upper Clark Fork	66	78	80
Bitterroot	58	66	62
Lower Clark Fork	78	70	71
Missouri River Basin	62	85	90
Jefferson	63	77	82
Madison	67	71	85
Gallatin	64	89	77
Headwaters Mainstem	47	91	96
Smith-Judith-Musselshell	54	88	95
Sun-Teton-Marias	59	90	106
St. Mary-Milk	131	100	104
Yellowstone River Basin	62	89	92
Upper Yellowstone	65	88	86
Bighorn	71	95	101
Tongue	51	85	92
Powder	75	116	132
West of Divide	84	77	82
East of Divide	67	86	91
Montana State-Wide	75	82	86

Monthly Precipitation - Percentage of 1981-2010 Normal December 1st, 2019 - December 31st, 2019



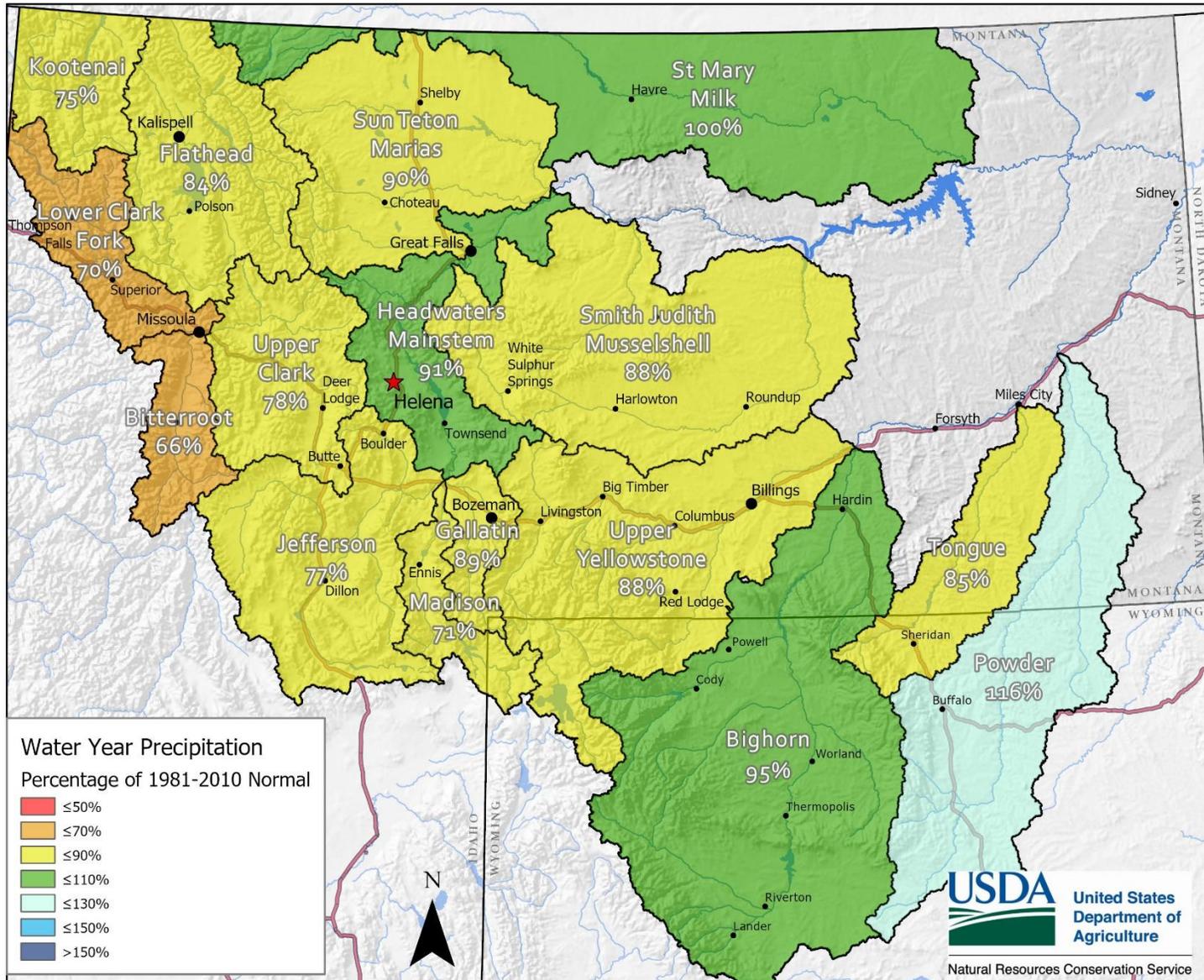
Created by the USDA-NRCS Montana Snow Survey Staff on: 1/8/2020

Monthly Precipitation - Percentage of 1981-2010 Normal December 1st, 2019 - December 31st, 2019



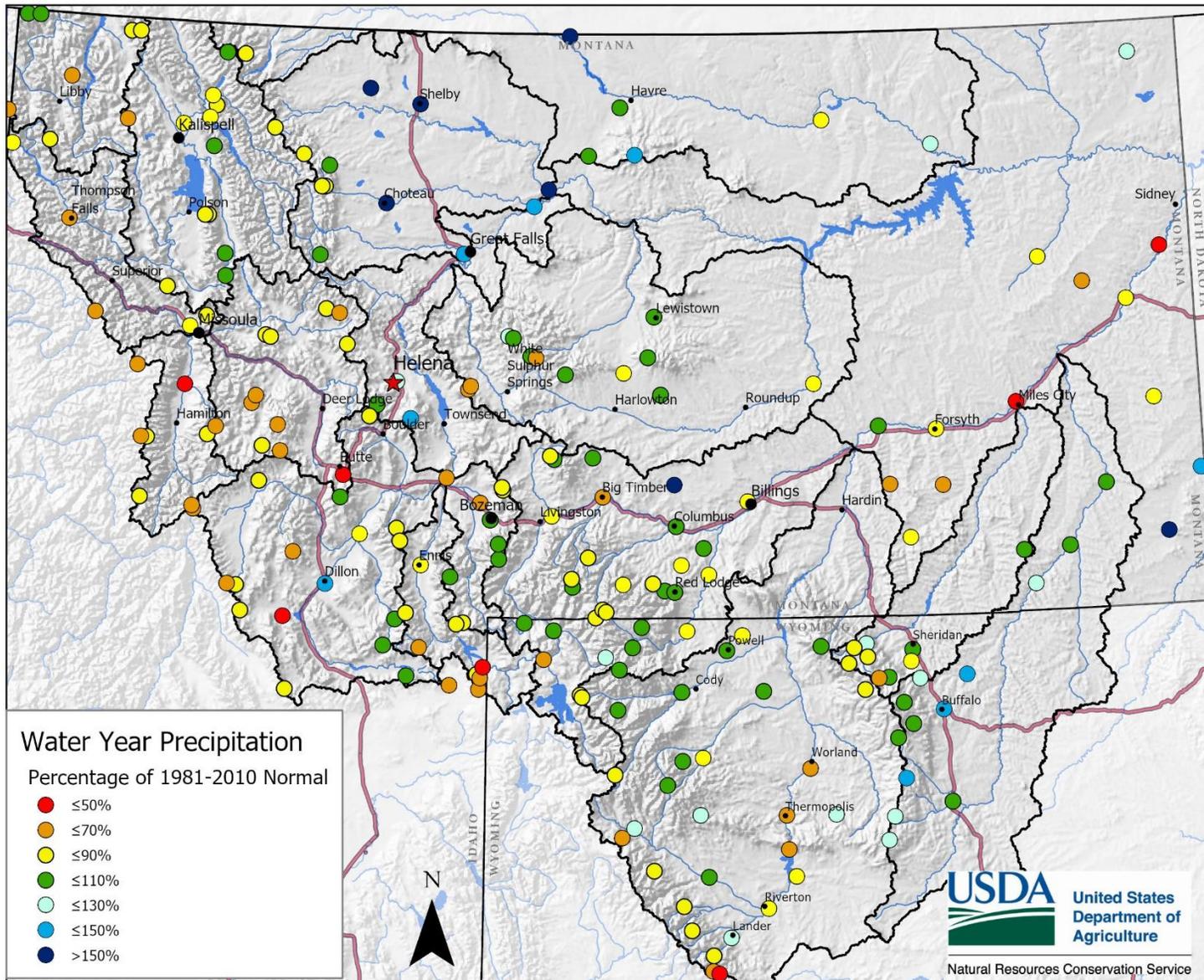
Created by the USDA-NRCS Montana Snow Survey Staff on: 1/8/2020

Water Year Precipitation - Percentage of 1981-2010 Normal January 1st, 2020



Created by the USDA-NRCS Montana Snow Survey Staff on: 1/8/2020

Water Year Precipitation - Percentage of 1981-2010 Normal January 1st, 2020



Created by the USDA-NRCS Montana Snow Survey Staff on: 1/6/2020

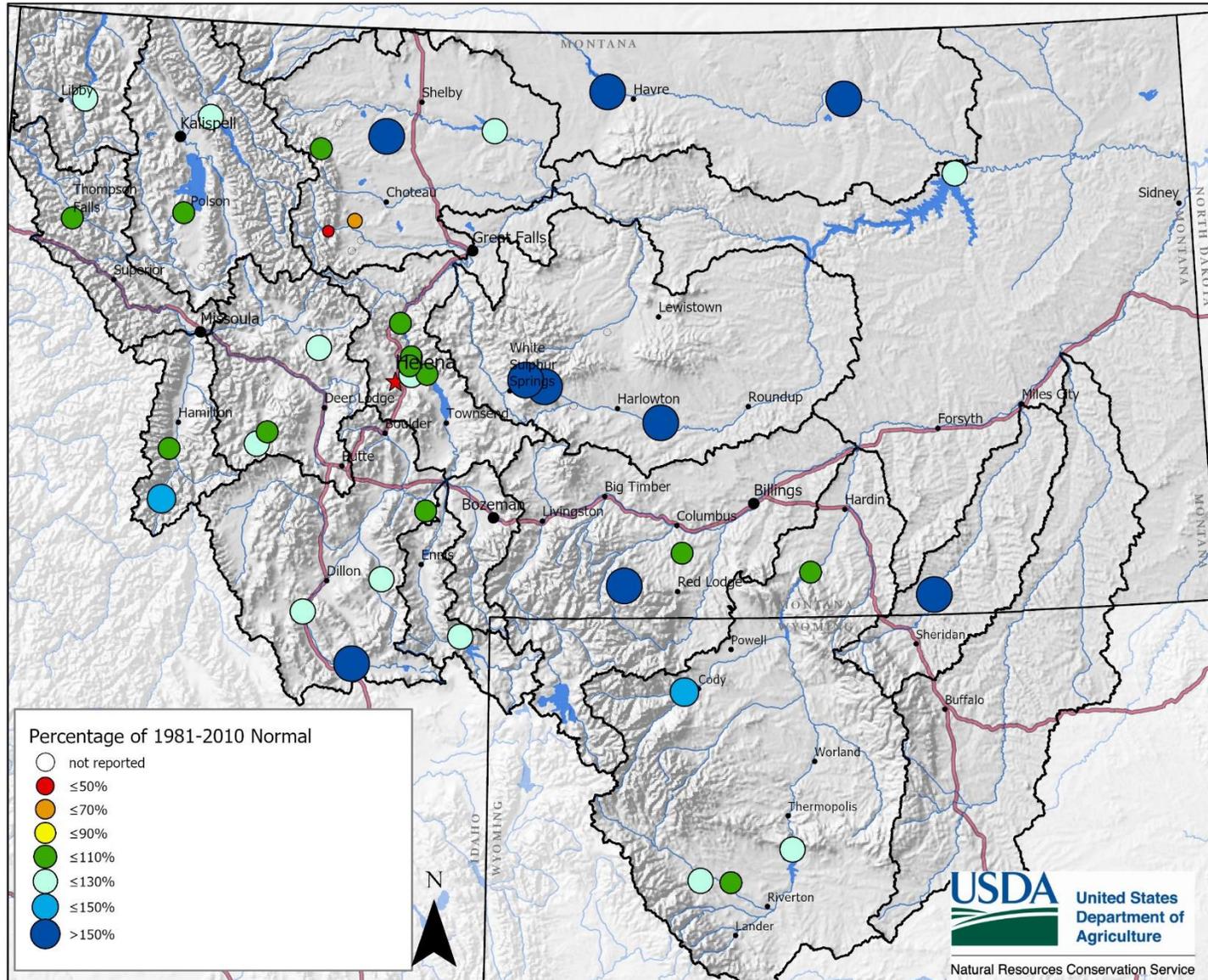
Reservoirs - Overview

Reservoir storage is in good shape at many locations across the state after last season's runoff and water use. Storage is near to above average in all locations except the Rocky Mountain Front, [where storage is below average for this date](#) in a few reservoirs.

Reservoir Storage

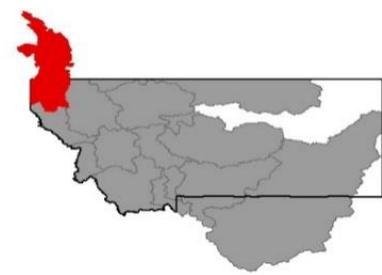
1/1/2020	<i>% Average</i>	<i>% Capacity</i>	<i>% Last Year</i>
Columbia River Basin	119	78	106
Kootnenai in Montana	127	75	111
Flathead in Montana	115	81	103
Upper Clark Fork	109	73	103
Bitterroot	123	29	97
Lower Clark Fork	96	91	97
Missouri River Basin	117	80	100
Jefferson	125	54	93
Madison	110	82	97
Gallatin	107	53	104
Headwaters Mainstem	119	83	100
Smith-Judith-Musselshell	177	88	104
Sun-Teton-Marias	112	58	107
St. Mary-Milk	153	60	125
Yellowstone River Basin	110	68	107
Upper Yellowstone	126	64	109
Bighorn	107	69	107
Tongue	182	61	98
West of Divide	119	78	106
East of Divide	116	79	100
Montana State-Wide	117	79	102

Reservoir Contents - Percentage of 1981-2010 Normal January 1st, 2019



Created by the USDA-NRCS Montana Snow Survey Staff on: 1/6/2020

Kootenai River Basin



Coming off of a relatively wet September, things were looking up weather-wise from earlier in the 2019 water year, where dry conditions had been persistent in the Kootenai River basin. After October 1st, the water year got off to a promising start with near to above-average precipitation totals for October. As such, drought determinations, which had been listed as [D1 within the basin in early September](#), were improved to no drought by [October 8th](#). Unfortunately, the favorable weather patterns of September and October would return to a drier more zonal flow in November and December, ushering needed moisture south of the Northern Rockies. November mountain precipitation would end up being the [first or lowest on record](#) for many sites within the basin, a hard knock considering November is statistically one of the “wettest” months of the year. The first half of December was also a bust, but at the end of the month an “[atmospheric river](#)” would point itself squarely at the northwest corner of Montana, and Canada, and provide abundant moisture at the SNOTEL sites along the Canadian border in Montana and interior British Columbia. The high elevation [Hawkins Lake SNOTEL site](#) went on to receive 5.3 inches of Snow Water Equivalent (SWE) and 6.3 inches of precipitation. This event was accompanied by warm air, resulting in high rain/snow lines within the basin. Lower elevation sites, like the [Garver Creek SNOTEL](#), would receive mostly rain during the event, with only 1 inch of SWE increase and 3.8 inches of precipitation. Snowpack and water year precipitation totals are near to slightly above normal in the Yaak River basin on January 1st, but snowpack and water year precipitation totals degrade as you move from north to south within the basin. Due to the importance of early-season precipitation in this region, a close eye will be kept on the area to see if the early deficits can be made up by runoff this spring and summer.

Kootenai River Basin Data Summary

	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
Snowpack		
<i>KOOTENAY in CANADA</i>	98%	80%
<i>KOOTENAI MAINSTEM</i>	77%	86%
<i>TOBACCO</i>	96%	93%
<i>FISHER</i>	83%	81%
<i>YAAK</i>	115%	89%
<i>KOOTENAI RIVER BASIN in MONTANA</i>	89%	88%
<i>KOOTENAI ab BONNERS FERRY</i>	94%	86%
Basin-Wide Snowpack	89%	88%

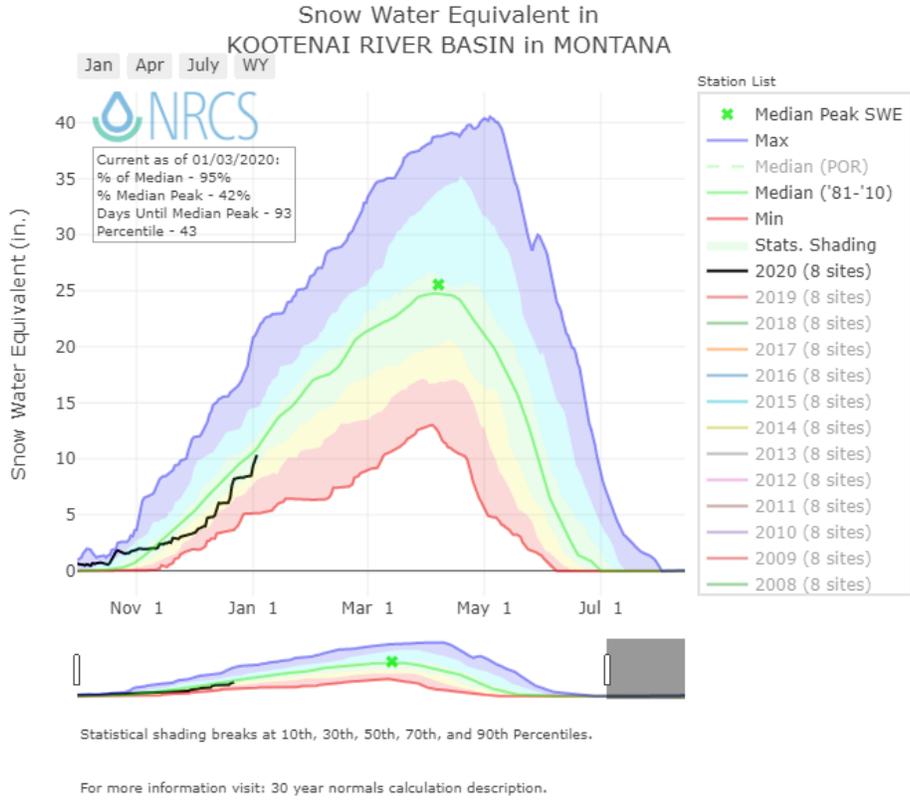
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Precipitation			
Mountain Precipitation	112%	75%	82%
Valley Precipitation	%	%	%
Basin-Wide Precipitation	112%	75%	82%

*WYTD Precipitation is October 1st- Current

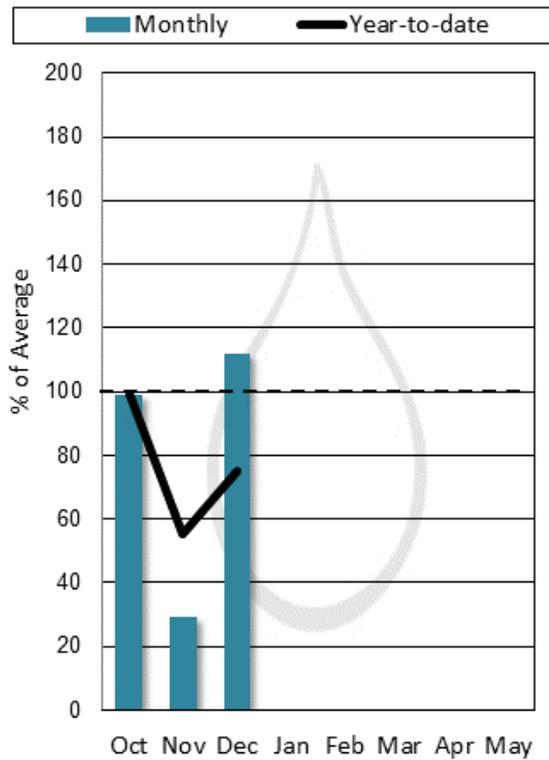
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Reservoir Storage	127%	75%	114%

*See Reservoir Storage Table for storage in individual reservoirs

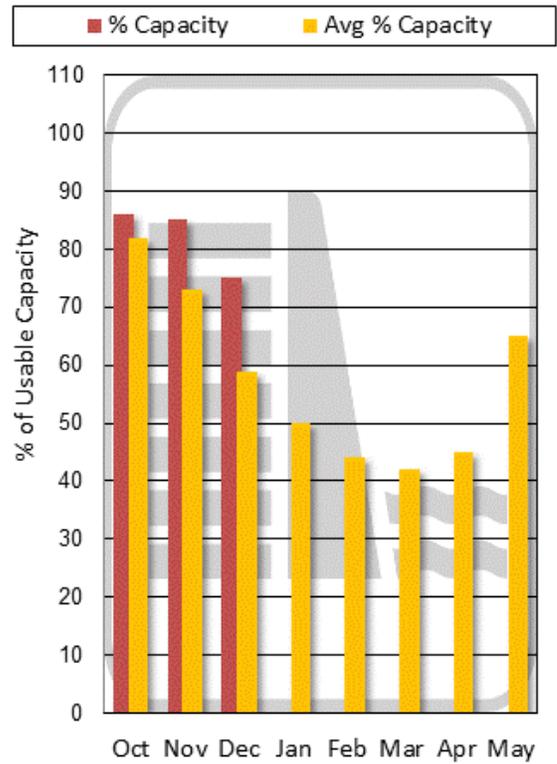
(click to navigate to [online version](#) with additional features)



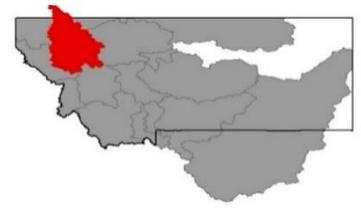
Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.



Flathead River Basin

After abundant moisture poured into Montana from the Pacific in late September through the middle of October, the rest of November and December would remain mostly dry, with only a few significant storms impacting the Flathead River basin. For most monitoring sites within the basin, [October would be recorded as above average](#), mainly due to the storms that impacted the region between October 19th and 22nd, and another small event on October 28th. November precipitation, [which historically is one of the “biggest” months of the year](#) with regards to monthly precipitation totals, would end up yielding only 50 to 70 percent of average precipitation. December would follow suit, with a persistent weather pattern in place that has shifted moisture from the Pacific south of the northern tier states for most of the month. Fortunately, as the month ended, this pattern would break down and allow moisture back into western Montana, a lot of moisture. [Three-day storm totals](#) would range from 0.7 to 1.3 inches of SWE at lower elevations, while mid and upper elevations in the Swan and Mission Ranges would receive up to 3.8 inches of SWE during the storm. Although these totals were impressive, the month of December overall would end up below average at most mountain SNOTEL sites due to the lack of moisture early in the month. Snowpack wise, the end of month storm would help to aid snowpack totals entering the new year, [but most sites remain below normal on January 1st](#) due to the lack of November and December snowfall. Only the high elevation Noisy Basin SNOTEL site east of Kalispell has a snowpack that is above normal for this date.

Flathead River Basin Data Summary

<i>Snowpack</i>	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
NF FLATHEAD in CANADA	%	%
NF FLATHEAD in MONTANA	98%	87%
MIDDLE FORK FLATHEAD	114%	82%
SOUTH FORK FLATHEAD	107%	89%
STILLWATER-WHITEFISH	78%	80%
SWAN	97%	90%
MISSION VALLEY	87%	91%
LITTLE BITTERROOT-ASHLEY	%	%
JOCKO	82%	88%
FLATHEAD in MONTANA	97%	87%
Basin-Wide Snowpack	97%	87%

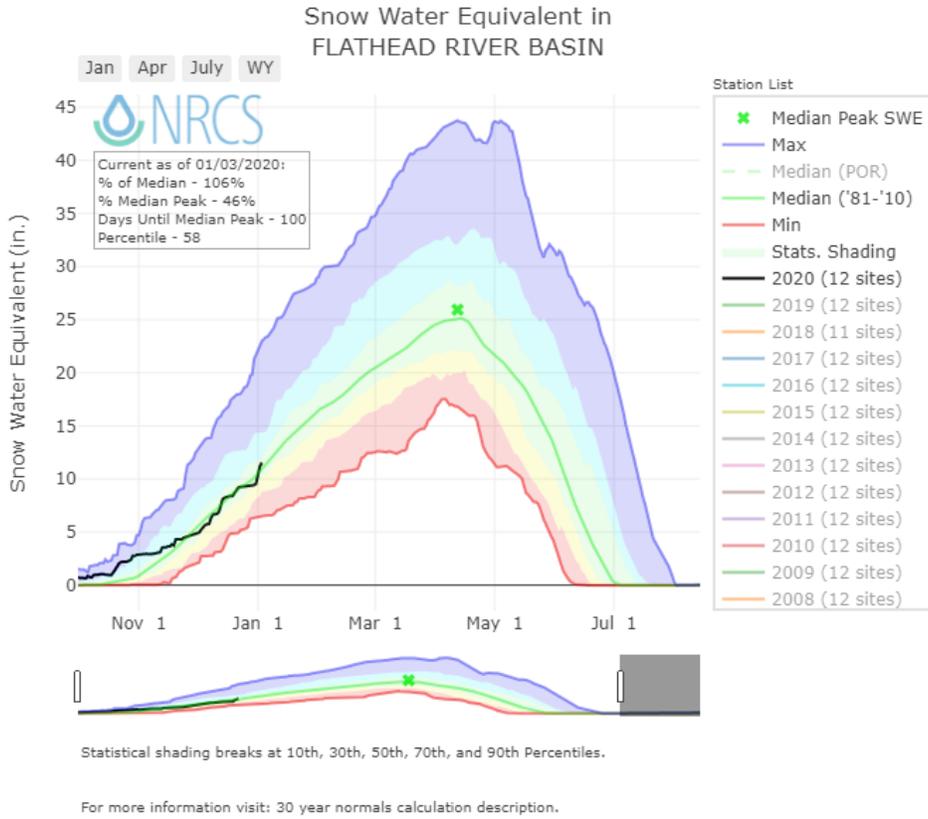
<i>Precipitation</i>	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	98%	85%	94%
Valley Precipitation	60%	71%	85%
Basin-Wide Precipitation	97%	84%	94%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

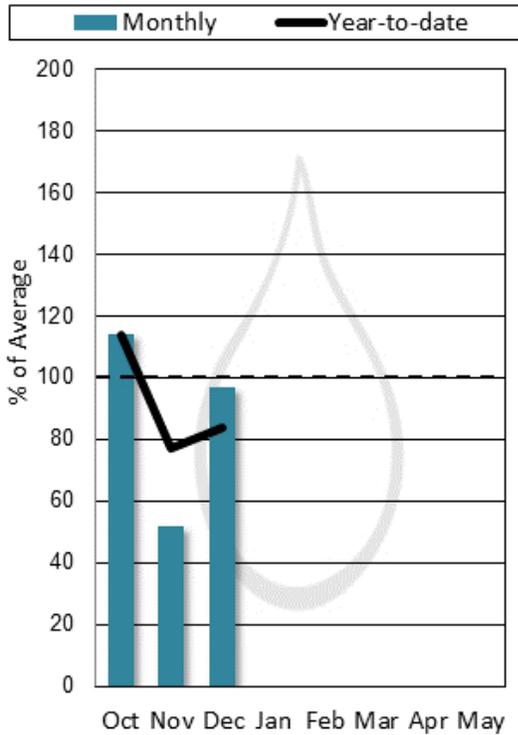
<i>Reservoir Storage</i>	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Reservoir Storage	115%	81%	112%

*See Reservoir Storage Table for storage in individual reservoirs

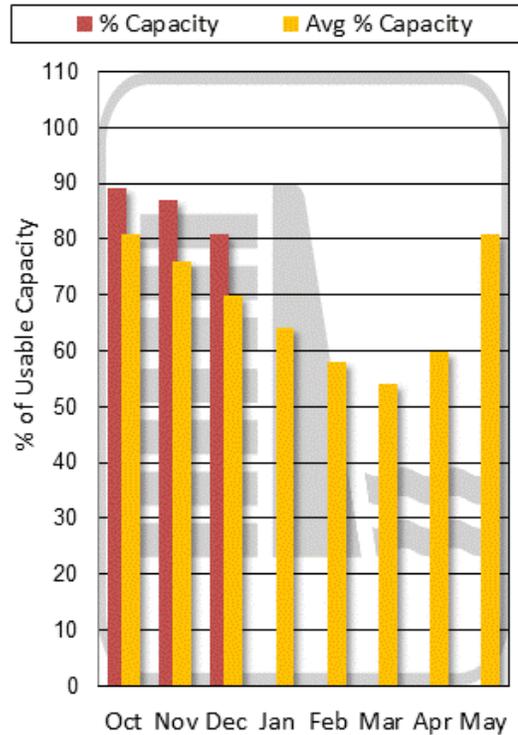
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.



Upper Clark Fork River Basin

Like most of western Montana, the water year started with a bang in the Upper Clark Fork River basin, where late September rain and high elevation snow, combined with above-normal precipitation during October to boost water year precipitation and snowpack totals on November 1st. Unfortunately, this wet pattern wouldn't last long, giving way to mostly dry conditions through November and December. The end of month storm, which impacted the region during the transition into the New Year, would help increase December precipitation totals but was not enough to make up for the dry early weeks of December when looking at monthly totals. [December monthly precipitation ranged from 11 percent to 77 percent of average](#) at mountain SNOTEL sites. Even with the beneficial rain and snow early in the water year, water year-to-date precipitation totals [remain below average on January 1st](#), ranging from 61 percent to 88 percent of average at mountain SNOTEL sites. As such, [snowpack is also below normal for this date](#). The healthiest snowpack is found in the high elevations of the Pintler Range and Nevada Mountains, where snowpack is near normal for this date. Much to the chagrin of local skiers and snowmobilers, the remaining ranges in the river basin are below normal to well below normal for snowpack on this date. With wetter weather forecasted to persist into the new year, some recovery could be made in the coming weeks. Fingers crossed that the New Year marks a big switch for the winter, and the pattern persists.

Upper Clark Fork River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
<i>CLARK FORK ab FLINT CREEK</i>	95%	99%
<i>FLINT CREEK</i>	92%	114%
<i>ROCK CREEK</i>	76%	97%
<i>CLARK FORK ab BLACKFOOT</i>	90%	101%
<i>BLACKFOOT</i>	82%	85%
Basin-Wide Snowpack	85%	94%

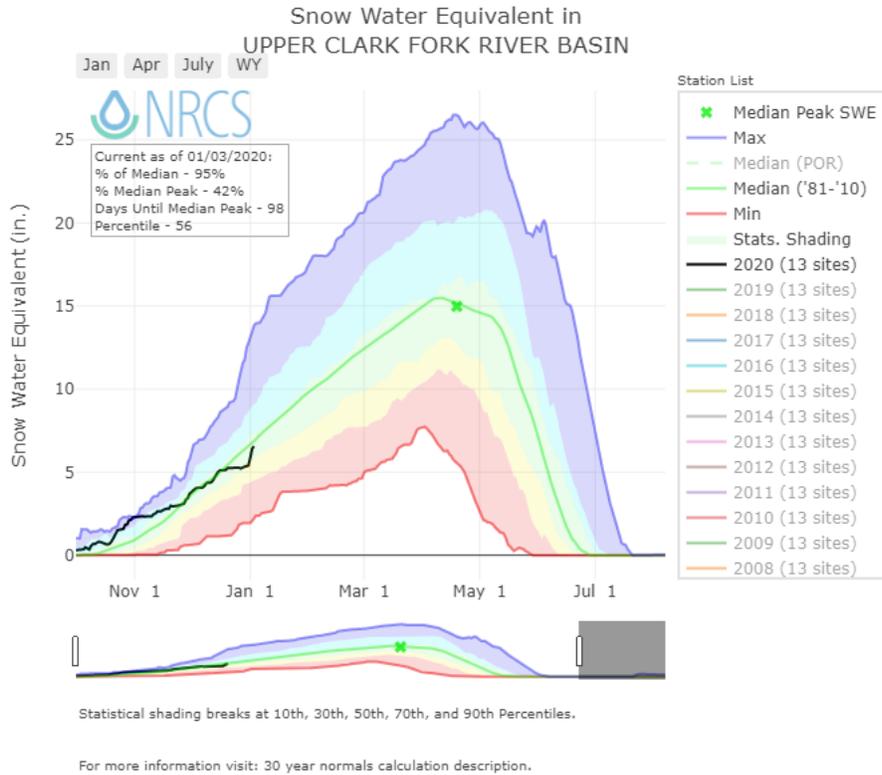
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	66%	79%	98%
Valley Precipitation	20%	34%	86%
Basin-Wide Precipitation	66%	78%	98%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

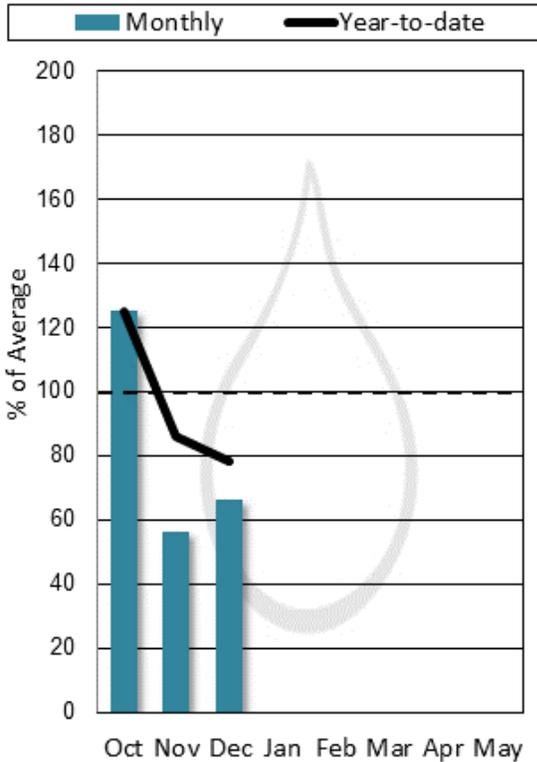
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	109%	73%	106%

*See Reservoir Storage Table for storage in individual reservoirs

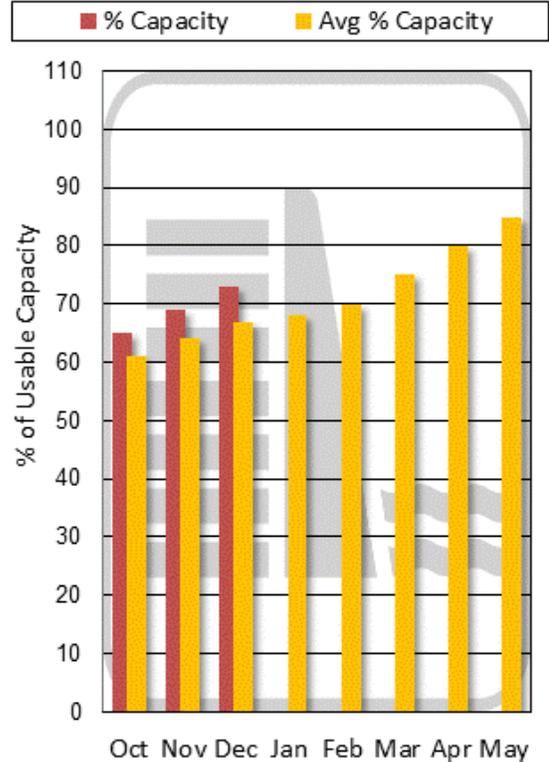
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Bitterroot River Basin



Starting the new water year in October, the Bitterroot River basin looked to be off to a promising start. Moisture in during the latter half of September wetted local soils, and a significant storm event between October 18th and 23rd would start the seasonal snowpack at many locations and boost water year precipitation to well above normal by the end of the month. While October was cold and wet, November would turn out to be rather dry in the region. Monthly precipitation totals would end up being a paltry 17 to 50 percent of average with a few mountain SNOTEL sites reporting [the lowest or second-lowest November precipitation on record](#). December would, unfortunately, follow the same dry pattern through most of the month, until a major storm impacted the region just as the new year was dawning. The Central Bitterroot Range would be most impacted by the storm, receiving 1.4 to 2 inches of snow water equivalent (SWE) between December 31st and January 2nd, the equivalent of up to 2 feet of snow. The Sapphire Range and Southern Bitterroot received less snow from the storm, ranging from 0.5 to 1.1 inches of SWE. Even with the impressive storm totals, the Bitterroot River basin remains below normal for snowpack and water year precipitation on January 1st. Current weather patterns forecasted to persist through the early half of January could put a dent in the water year mountain precipitation deficits, which range from 1 to 8 inches on January 1st. However, it will take anomalously wet weather to do so. [January is the last of the “big” months](#) with regards to mountain precipitation, meaning the later in the year these deficits persist, the less likely they are to occur.

Bitterroot River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
WEST FORK BITTERROOT	74%	87%
EAST SIDE BITTERROOT	73%	89%
WEST SIDE BITTERROOT	68%	109%
Basin-Wide Snowpack	71%	100%

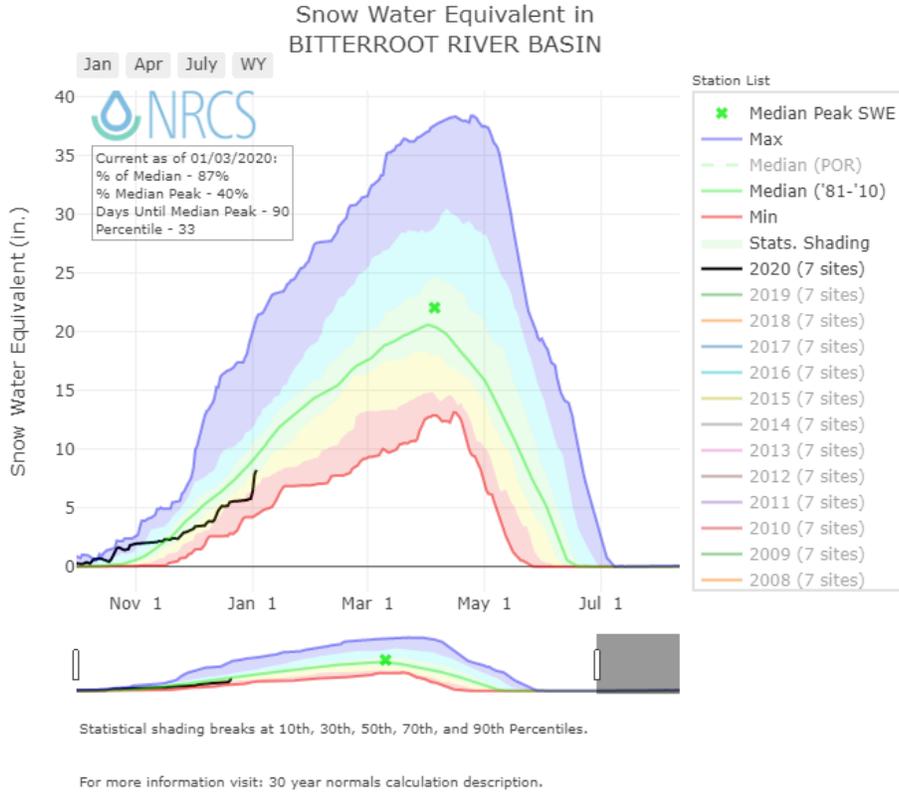
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	58%	66%	107%
Valley Precipitation	%	%	%
Basin-Wide Precipitation	58%	66%	107%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

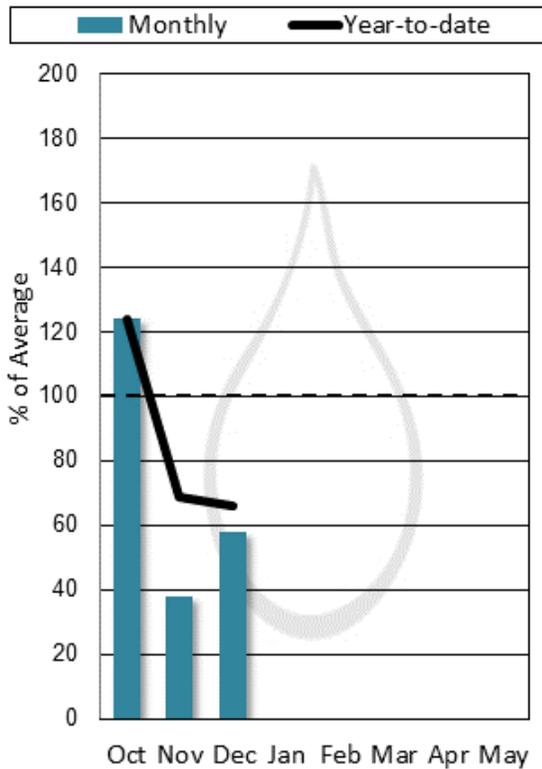
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	123%	29%	127%

*See Reservoir Storage Table for storage in individual reservoirs

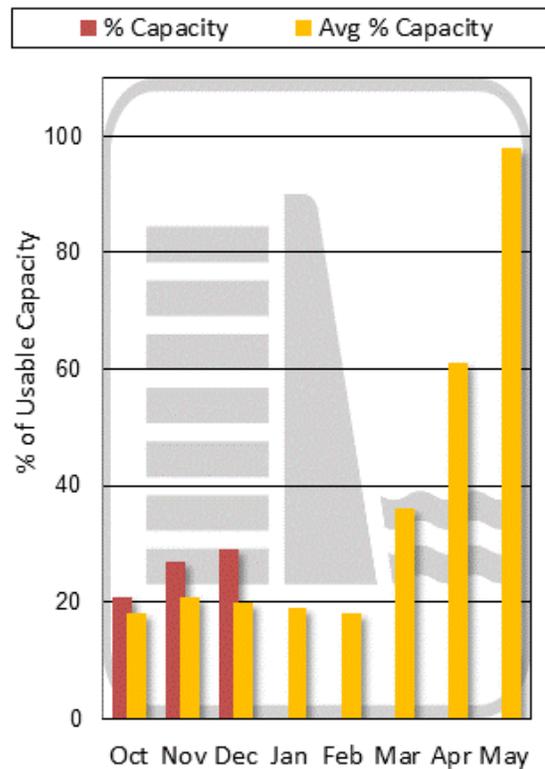
(click to navigate to [online version](#) with additional features)



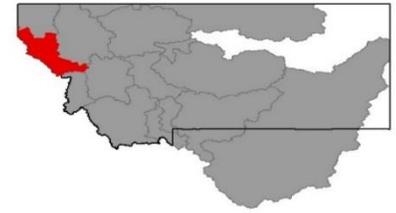
Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.



Lower Clark Fork River Basin

Sadly, of all of the major river basins in Montana, the Lower Clark Fork is in the roughest shape right now with regards to water year precipitation and snowpack on January 1st. After was seemed like an excellent start to the water year in October, which yielded near to above-average precipitation to the basin, the dry weather patterns of November and December would cause totals for snowpack and precipitation to start their slow decline since November 1st. November was unusually dry, with seven SNOTEL sites used to gauge snowpack and precipitation within the ranges feeding the Lower Clark Fork [setting new record lows](#) for monthly precipitation. December, for the most part, would continue this dry pattern until the end of the month when abundant moisture spilled into the region. [Storm totals for the end of year event](#) would equal up to 3.6 inches of snow water in the Cabinet Mountains, 2.0 to 2.8 inches in the northern Bitterroot, and 1.1 to 2.7 inches in the Nine-Mile and Rattlesnake areas. While this storm would greatly improve the skiing at Montana Snowbowl and Lookout Pass, it wasn't enough to improve snowpack totals to near normal for January 1st. Snowpack totals are the lowest along the Idaho border in the northern Bitterroots, but conditions improve as you move north and east within the basin. The lack of precipitation in November and December has resulted in water year precipitation deficits that range from 0.7 inches to as much as 10.6 inches in the Cabinet Mountains. As we move into the next few months of winter, making up for these deficits becomes less likely [based on historical precipitation distribution](#). Only time will tell, but it is something to keep a close eye on as winter progresses. January is historically the "biggest" month for precipitation within the basin, but it will need to be extra snowy this year if we hope to get back to normal.

Lower Clark For River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
LOWER CLARK FORK RIVER BASIN	65%	94%
Basin-Wide	65%	94%

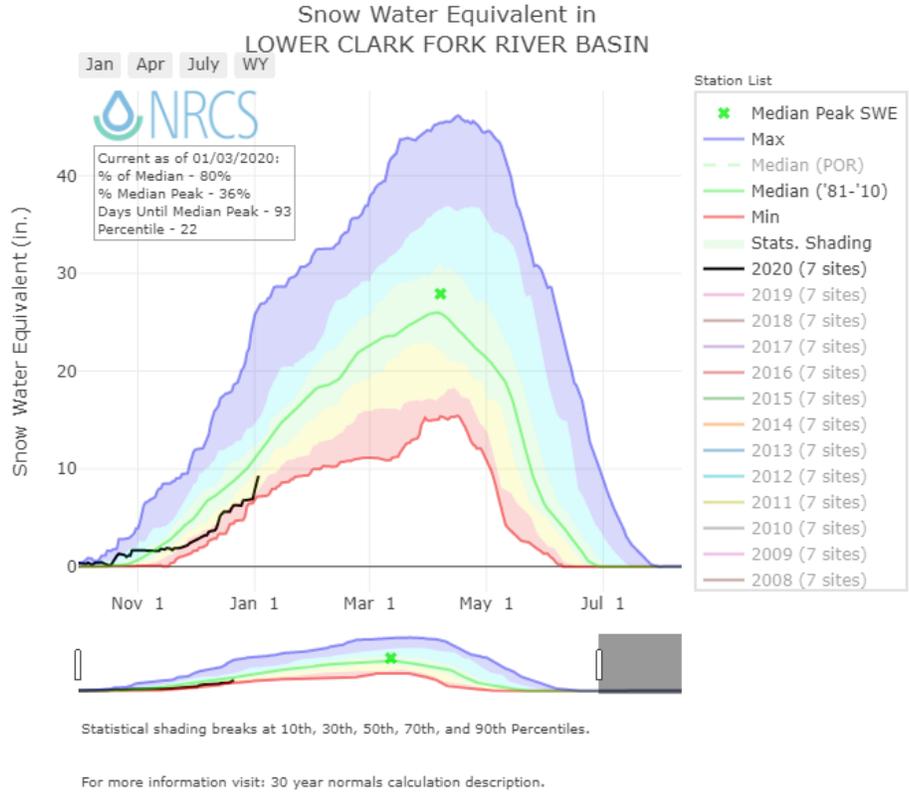
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	73%	69%	97%
Valley Precipitation	112%	75%	107%
Basin-Wide Precipitation	78%	70%	98%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

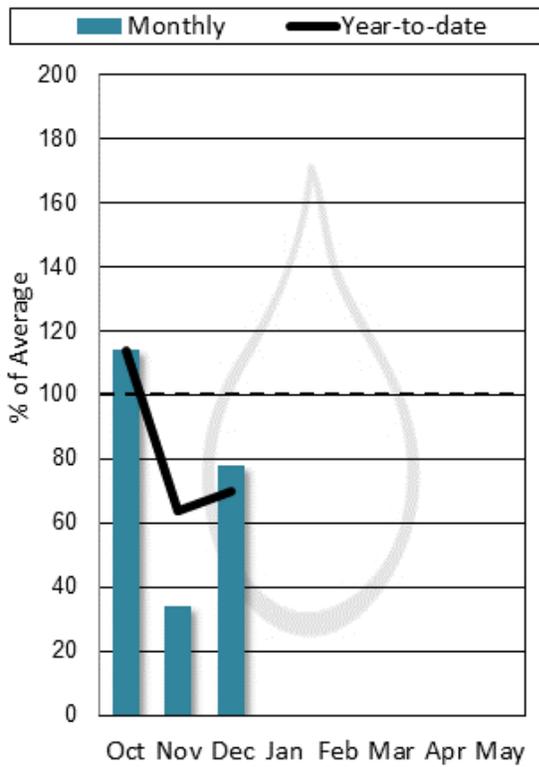
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	96%	91%	99%

*See Reservoir Storage Table for storage in individual reservoirs

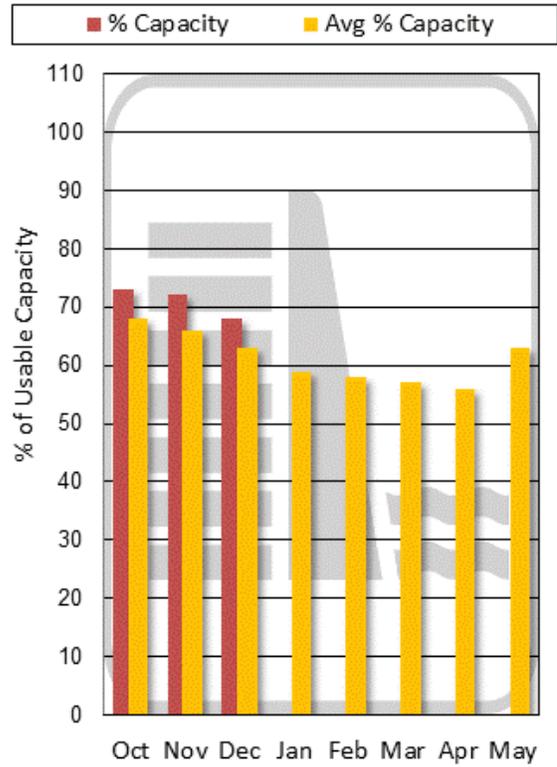
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Jefferson River Basin



After having received mountain snowfall at the end of September, it seemed like the Jefferson River basin was off to a promising start to the new water year. October continued to deliver above-average precipitation across the basin, building the base of the mountain snowpack in many locations. Unfortunately, November had other things in mind, delivering only paltry amounts of precipitation, which would be well below average for the month, [setting new records lows](#) at some mountain monitoring locations. Early December would continue along with the same dry trend, but during the latter half of the month, snow would return to the Jefferson River basin. [The Christmas storm blanketed Dillon, MT in up to 13" of snow](#), the second most snow since October of 1991. Ending the month, snowfall in the mountains would add up to 2.6 inches of Snow Water Equivalent (SWE) to the snowpack in the Beaverhead Range over three days, but snow totals were lower elsewhere, ranging from 0.5 to 1.1 inches of SWE. Although the storms during the latter half of the month helped to improve snowpack, the long hiatus of precipitable weather in November and early December resulted in snowpack and water year precipitation deficits that linger to this date in some regions. While most areas have improved to near or slightly below normal in the southern headwaters of the Jefferson, the snowpack in the northern Beaverhead and low elevations on the south side of the Pintler Range, feeding the Big Hole River, remain below normal. [Long-range weather forecasts](#) indicate a continuation of the weather patterns experienced in late December, which could help to improve areas where the snowpack is below normal on January 1st.

Jefferson River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
BEAVERHEAD	88%	78%
RUBY	92%	97%
BIGHOLE	83%	86%
BOULDER	109%	98%
Basin-Wide Snowpack	87%	88%

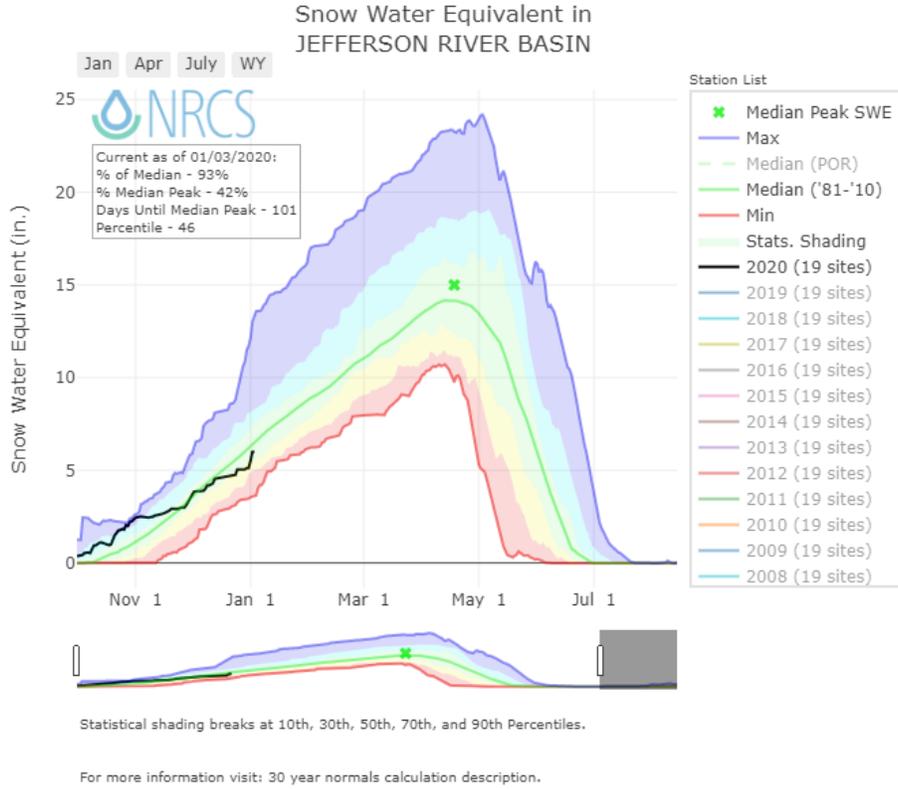
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	62%	77%	94%
Valley Precipitation	222%	137%	68%
Basin-Wide Precipitation	63%	77%	94%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

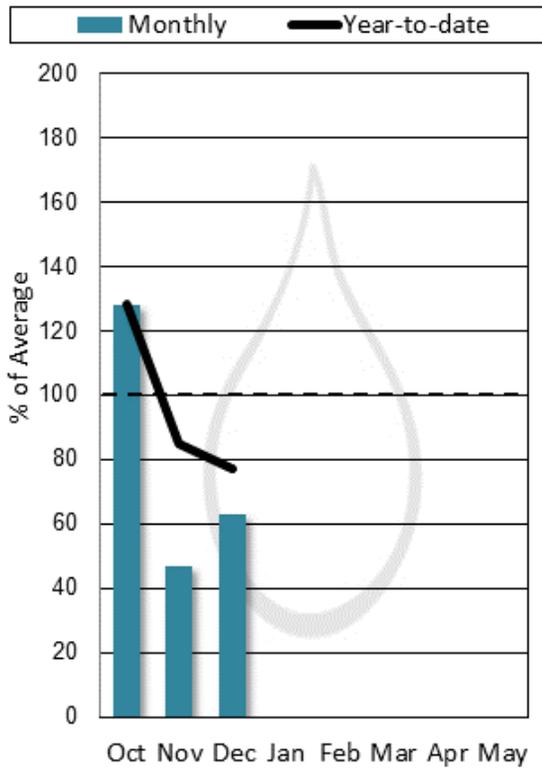
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	125%	54%	134%

*See Reservoir Storage Table for storage in individual reservoirs

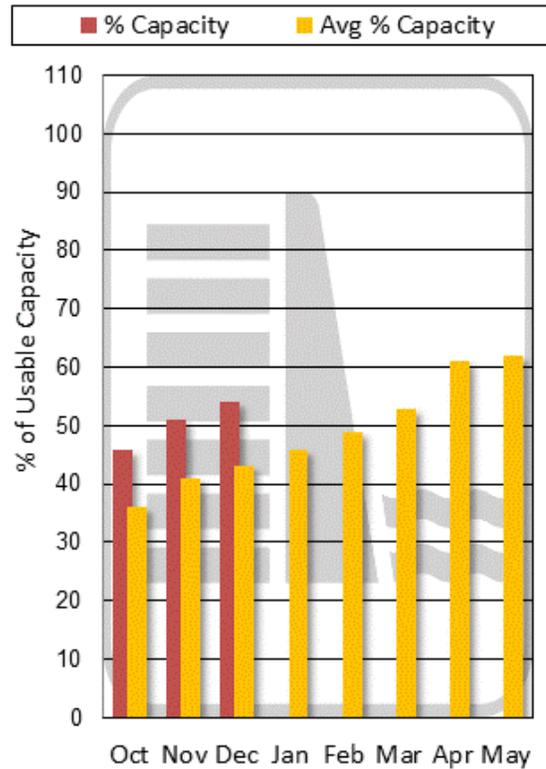
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation

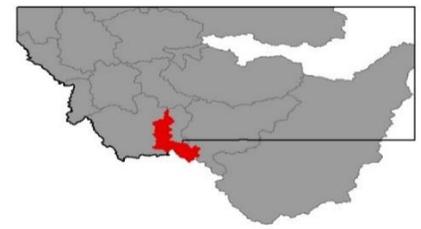


End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Madison River Basin



As the massive Brown trout from Ennis Lake began to move upriver into the Madison to spawn this fall, deftly navigating around all the flies cast by fishermen who thought they had a chance at landing them, a new (water) year began that might offer better luck to those shirked by selective trout last year. The new water year started with a bang, with many high elevation SNOTEL sites in the Madison and Gravelly Ranges having a snowpack on the ground on October 1st, remnants leftover from a late-September storm which blanketed the high country. The wet, and ultimately very cold, October would continue to build the mountain snowpack through the month, with almost all sites within the basin reporting near to above-average precipitation. However, the weather in Montana is fickle, and a significant change in weather patterns during November would ultimately result in decreases in basin snowpack and precipitation totals. While some small storm systems would push through most of the region in December, they weren't enough to make up for the lack of November precipitation. Both [snowpack](#) and water year precipitation are below normal for January 1st, and snowpack numbers are [oddly similar to last year at this time](#). The region with the lowest snowpack totals is the headwaters above Hebgen Lake, which ranges from 65 percent to 84 percent of normal. Elsewhere, the snowpack is below normal but not quite as low as in the headwaters of the Madison. With the traditionally ["big" months still](#) to come snowfall wise, it's not time to sell your new snow check sled, or new 5 weight rod, yet. However, if the trend continues, it will be something to keep an eye on.

Madison River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
MADISON <i>abv</i> HEBGEN LAKE	76%	65%
MADISON <i>blw</i> HEBGEN LAKE	81%	87%
Basin-Wide Snowpack	79%	77%

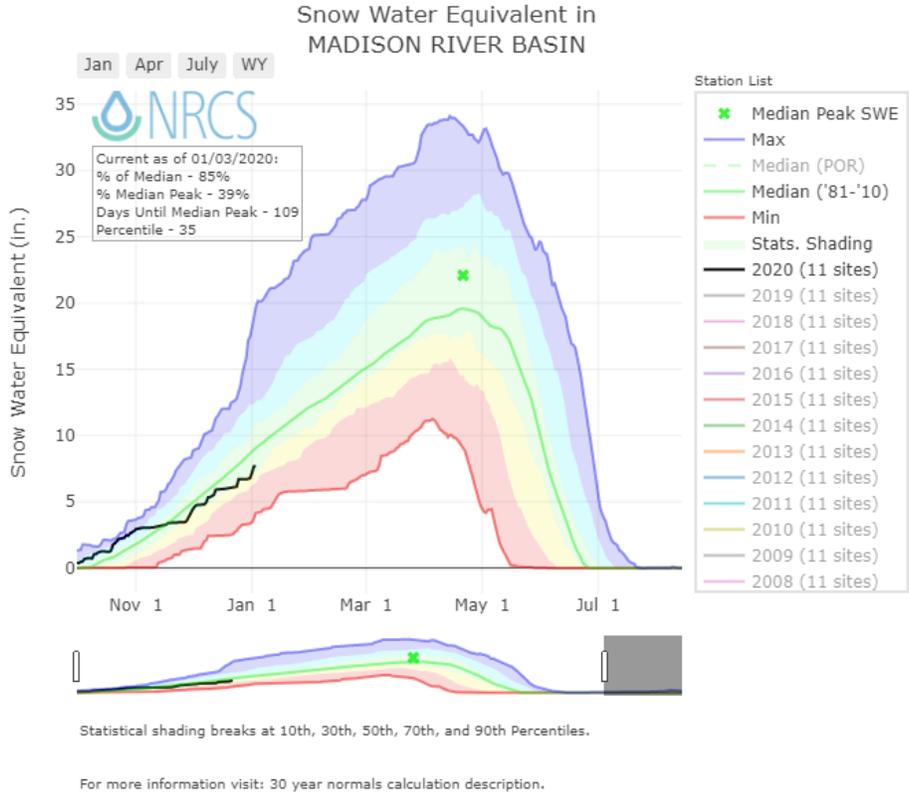
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	68%	71%	83%
Valley Precipitation	26%	80%	146%
Basin-Wide Precipitation	67%	71%	84%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

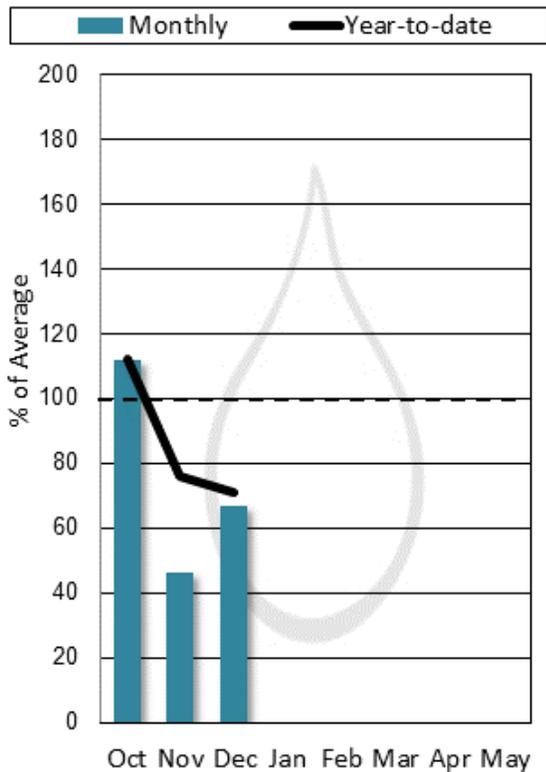
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	110%	82%	113%

*See Reservoir Storage Table for storage in individual reservoirs

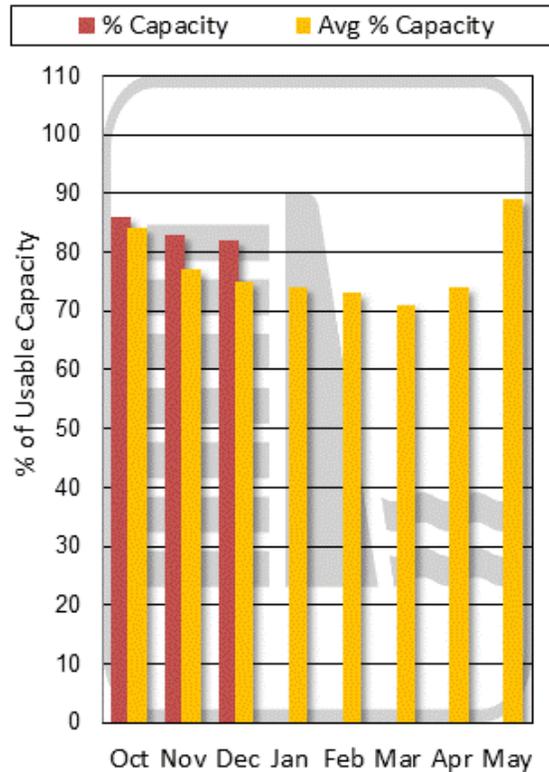
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Gallatin River Basin



Unlike many of the other southwest river basins, the first two months of the 2020 water year started well in the mountains and valleys of the Gallatin River basin. Due to a late September storm, a few high-elevation SNOTEL sites would start the water year on October 1st with snowpack in place, albeit shallow. Precipitation for the month of October was [well above average across the basin](#). November would follow suit with [near to above-average precipitation at all mountain locations](#), while valley locations received near to slightly below normal precipitation. December, as it turns out, would be a different story all together. If it seemed dry in December, that's because it was. Mountain locations received only 44 to 67 percent of normal snowfall for the month, resulting in decreased snowpack percentages by January 1st. Valley monitoring sites would only report 17 to 22 percent of average precipitation for December. Like last year, there is a north to south gradient of snowpack within the basin, with the southern ranges having the lowest snowpack for this date. Snowpack percentages for Jan 1st range from 71 percent to 99 percent of normal in the headwaters of the Gallatin above Gateway, 82 percent to 119 percent in Hyalite, and 79 percent to 92 percent in the Bridger Range. October 1st through January 1st aren't the [big months for precipitation](#) in the ranges feeding the Gallatin, but the deficits from December bear mentioning. As is mentioned in the opening snowpack narrative, the January 1st snowpack reports are more of a progress report than a report card. There's still time to recover from the "D"ecember, and current wetter weather patterns are forecasted to persist in early January. Let's hope the jet stream takes its grades seriously, and it doesn't go back down south to party again this winter.

Gallatin River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
UPPER GALLATIN	83%	85%
HYALITE	111%	122%
BRIDGER	94%	144%
Basin-Wide Snowpack	93%	108%

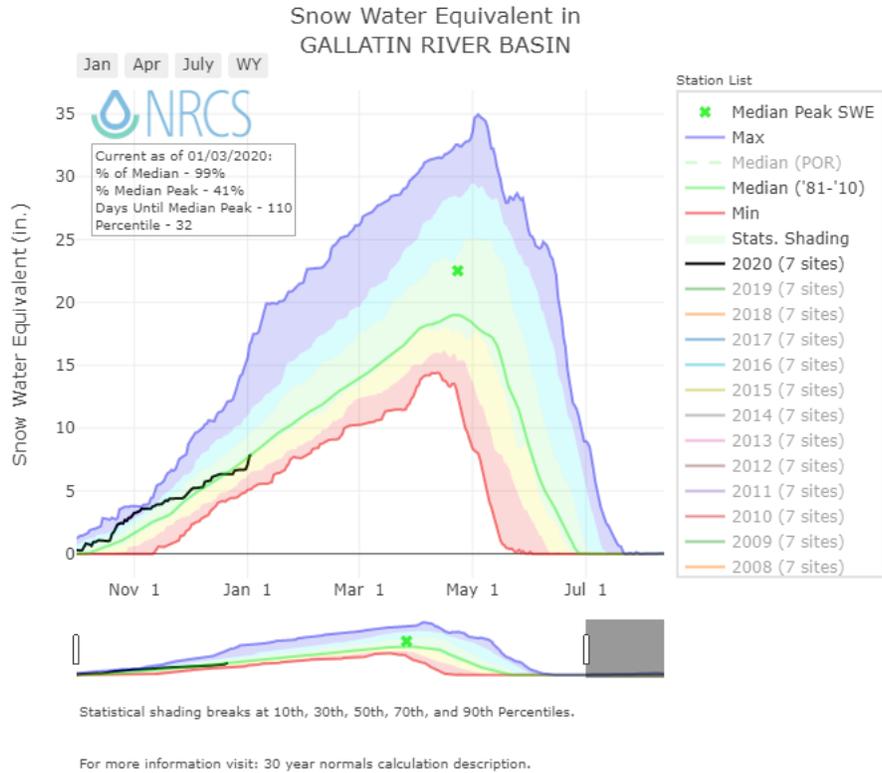
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	67%	90%	117%
Valley Precipitation	20%	84%	113%
Basin-Wide Precipitation	64%	89%	116%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

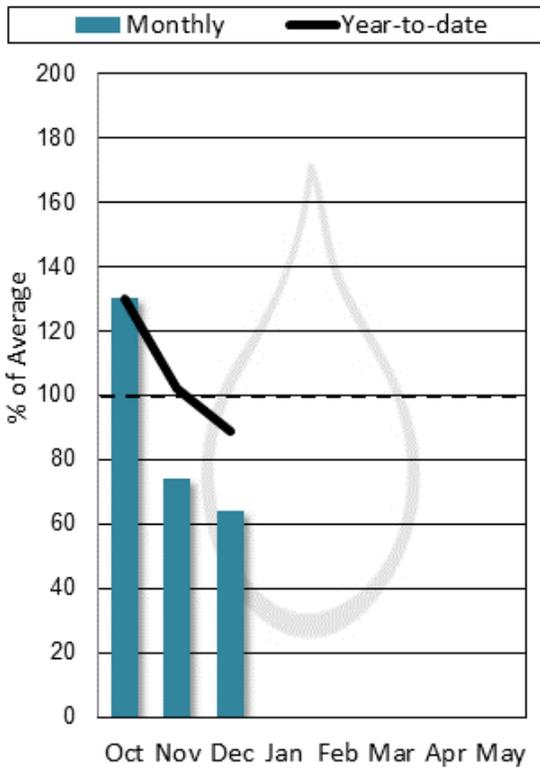
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	107%	53%	105%

*See Reservoir Storage Table for storage in individual reservoirs

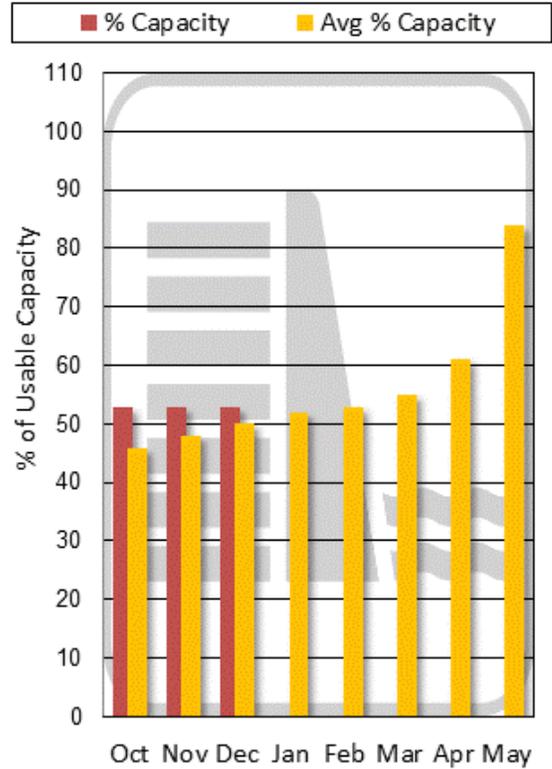
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation

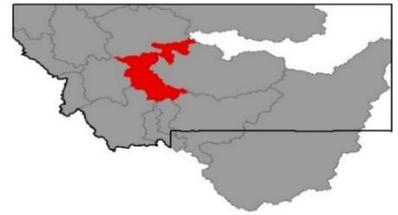


End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Headwaters Mainstem (Missouri) River Basin



The Headwaters Mainstem basin experienced an exceptionally wet September in which a couple of the basin’s SNOTEL sites received [record monthly precipitation](#). Most of this precipitation came in the last several days of the month, and all the basin’s SNOTEL sites began the new water year with snow on the ground. Below seasonal temperatures in October combined with precipitation brought more snow to the region. The remainder of the calendar year was significantly drier. November in the Big Belts brought well below-average precipitation, while the region south of Helena received near-average precipitation. The dry spell continued into December and was more widespread. Rocker Peak SNOTEL had the lowest December precipitation recorded in 42 years, and both Frohner Meadow and Nevada Ridge SNOTEL had 2nd lowest precipitation on record. See the [Interactive Map](#) for more details. Fortunately, due to the abundance of early-season precipitation, the snowpack in the Headwaters Mainstem River basin is near normal for January 1st.

Headwaters Missouri Mainstem River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
<i>HEADWATERS MAINSTEM</i>	95%	88%
Basin-Wide Snowpack	95%	88%

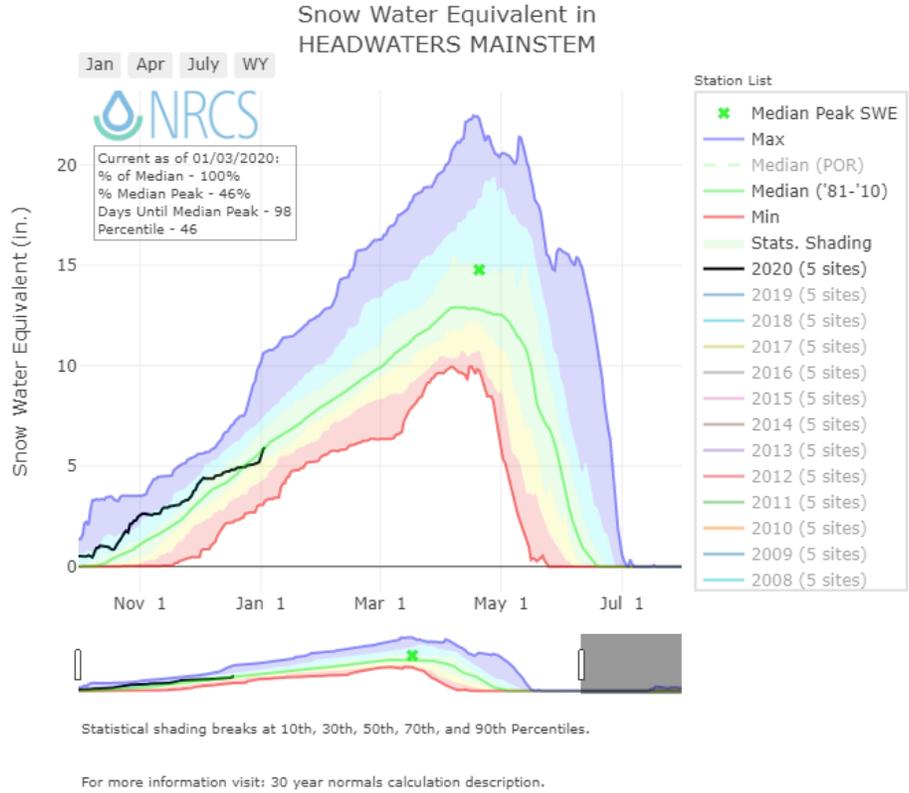
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	48%	89%	96%
Valley Precipitation	10%	118%	58%
Basin-Wide Precipitation	47%	91%	95%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

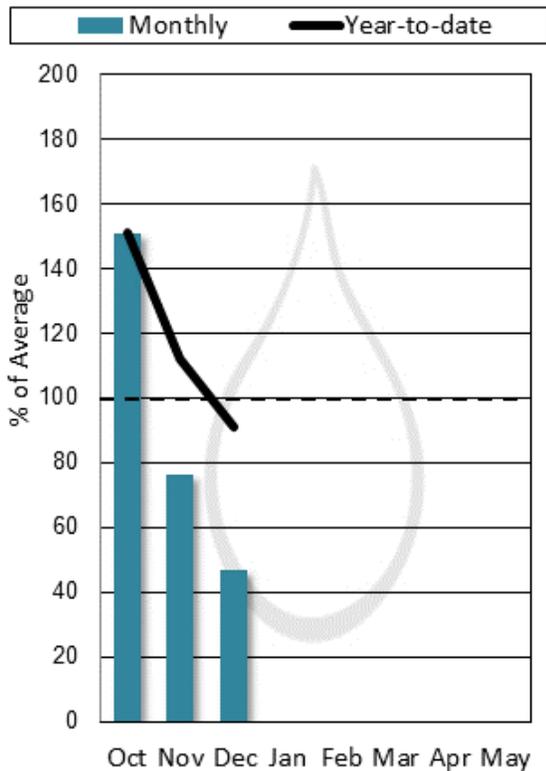
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	117%	82%	117%

*See Reservoir Storage Table for storage in individual reservoirs

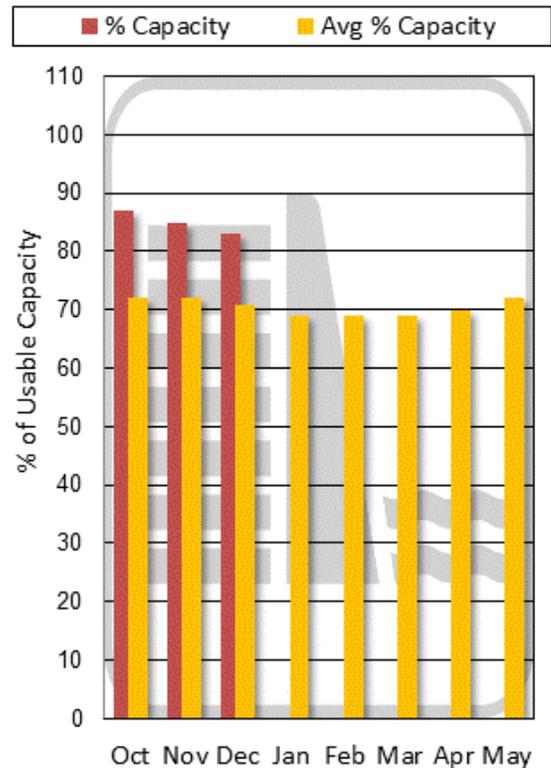
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation

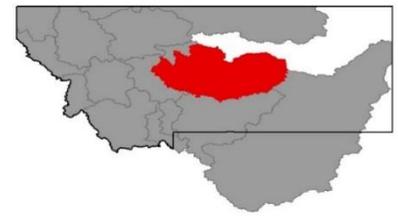


End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Smith-Judith-Musselshell River Basin



The Smith-Judith-Musselshell River basin received widespread significant precipitation in September, and all but the lowest elevation SNOTEL sites in the basin rolled into the new water year with snow on the ground. October brought below-average temperatures and above-average precipitation, which in retrospect, was needed to make up for changing weather patterns that followed. On November 1st, several of the basin’s SNOTEL sites had a shallow but near [record snowpack](#). After that was the start of a dry period that lasted through late December. During November, [Spur Park SNOTEL](#) recorded its second lowest amount of precipitation in 42 years. More of the same weather brought record-low precipitation totals in December. Currently, the basin has a slightly above average snowpack, which like the surrounding region, can be attributed to the significant amount of early-season snowfall.

Smith Judith Musselshell River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
SMITH	104%	85%
HIGHWOOD	%	%
JUDITH	118%	98%
MUSSELSHELL	101%	83%
Basin-Wide Snowpack	106%	89%

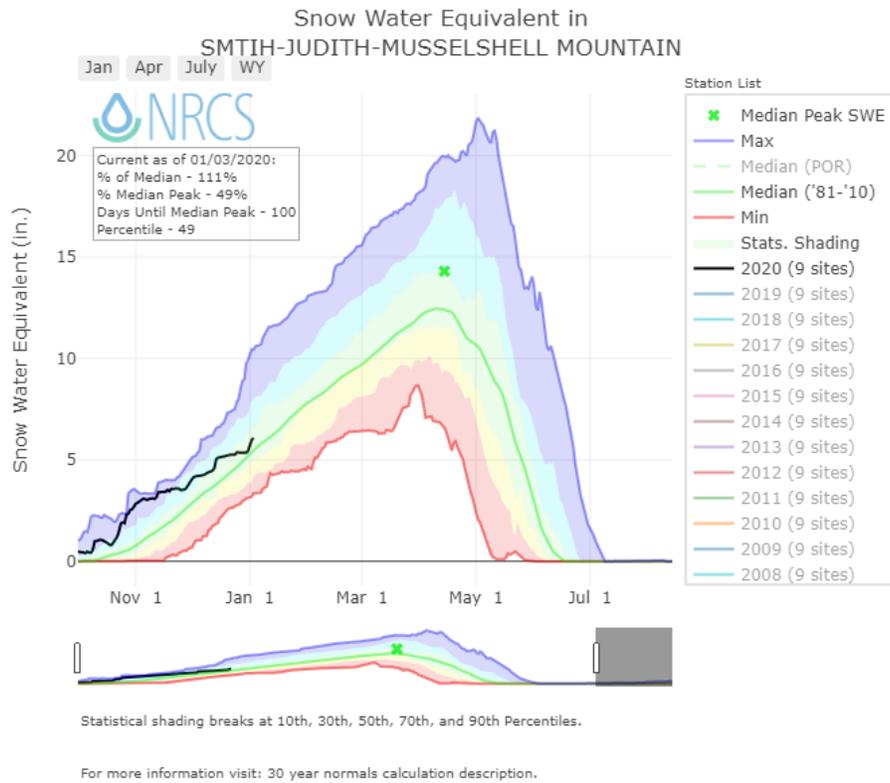
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	55%	87%	94%
Valley Precipitation	41%	98%	86%
Basin-Wide Precipitation	54%	88%	93%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

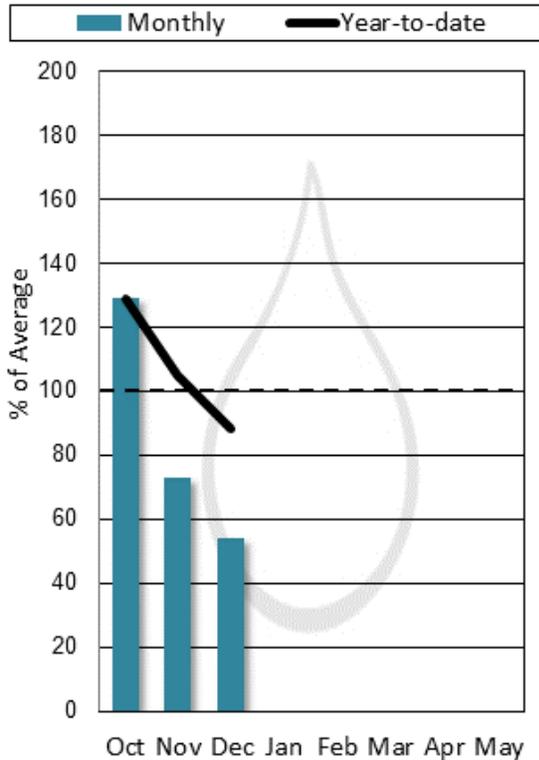
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	177%	88%	170%

*See Reservoir Storage Table for storage in individual reservoirs

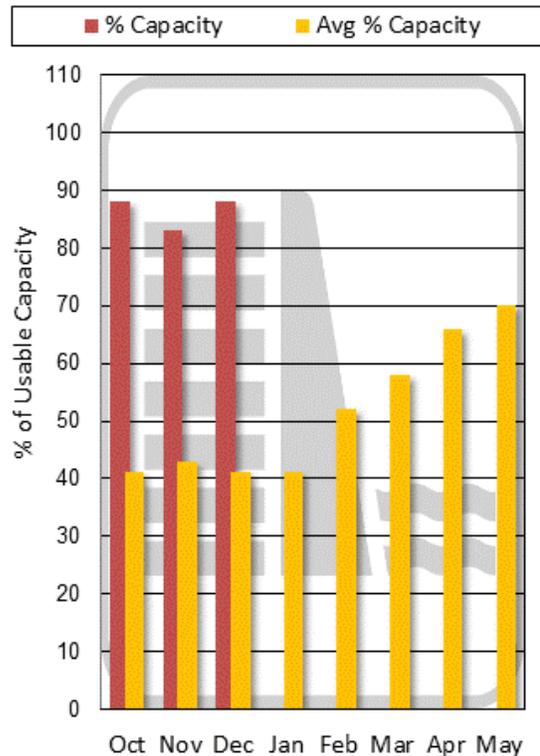
(click to navigate to [online version](#) with additional features)



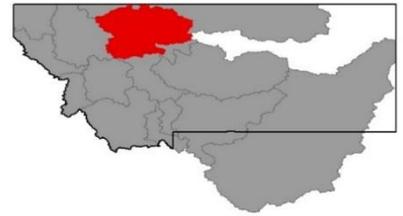
Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.



Sun-Teton-Marias River Basin

The transition from Water Year 2019 to 2020 will be one to remember in the Sun-Teton-Marias River basin. Starting on September 27th, a significant storm brought record amounts of precipitation to the Front Range. The epicenter of the storm was in both the mountain and valley region of the Sun-Teton-Marias basin. By September 29th, the low elevation [Dupuyer Creek SNOTEL](#) had received over 3 feet of snow. Valley snowfall was reportedly higher in some locations. Governor Bullock declared a [Winter Storm Emergency](#) in Montana due to this severe early season storm. To no surprise, every SNOTEL site in the basin had a [record snowpack](#) on October 1st. Overall, October brought above-average precipitation, including another significant storm later in the month. November was much drier, particularly in the mountains, which received well below average monthly precipitation. With 22 inches of depth and 4.9 inches of snow water, [Dupuyer Creek SNOTEL](#) had the most snow water content in 37 years on December 1st. In contrast, December didn't yield much precipitation, and Dupuyer Creek SNOTEL received a record monthly low amount of only 0.6 inches. Overall, due to the extraordinary amount of snow received in September-October, the basin's snowpack is currently above normal.

Sun-Teton-Marias River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
<i>SUN</i>	111%	81%
<i>TETON</i>	121%	81%
<i>MARIAS</i>	131%	77%
Basin-Wide Snowpack	122%	79%

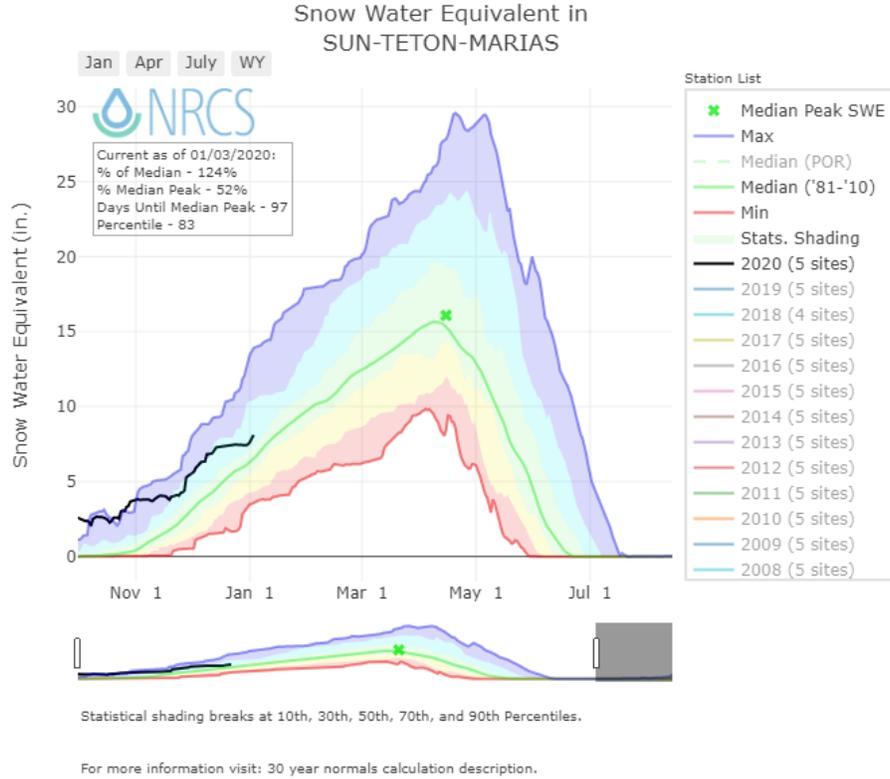
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	60%	86%	83%
Valley Precipitation	33%	222%	157%
Basin-Wide Precipitation	59%	90%	85%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

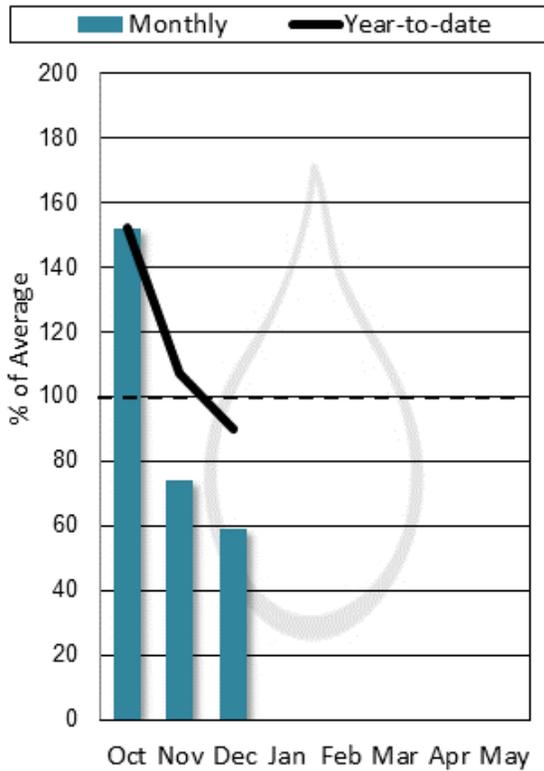
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	112%	58%	105%

*See Reservoir Storage Table for storage in individual reservoirs

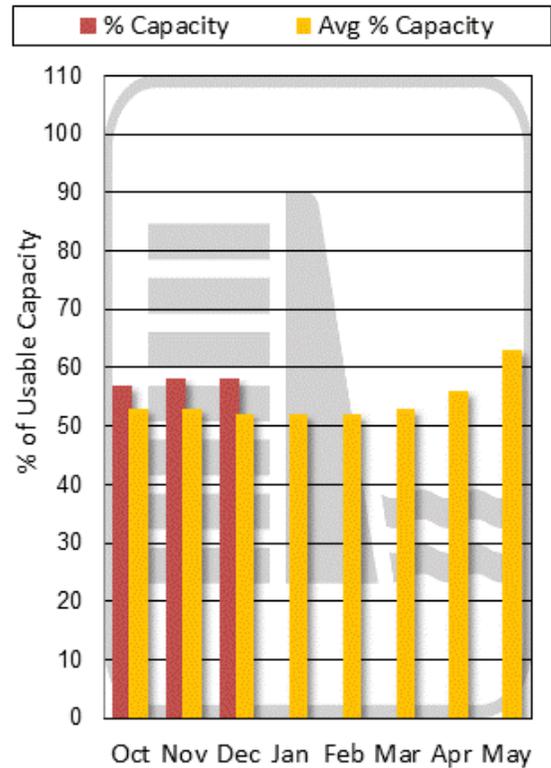
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

St. Mary-Milk River Basin



Located not too far from the epicenter of the major winter storm that rocked the Front Range in late September, the Saint Mary-Milk River basin surprising didn't get hit nearly as hard. Browning, less than 35 miles away from the Saint Mary River, reportedly received three to four feet of snow. At 6300 feet in elevation, [Flattop Mountain SNOTEL](#) only received 18 inches from this storm. Beginning the new water year, October yielded near average precipitation to the basin, much of which came during a large mid-month storm. During November, mountain weather stations received below-average precipitation; however, several valley weather stations along Highway 2 received record amounts of November precipitation. Overall, December precipitation was above average, except for the Bears Paws at the eastern end of the basin, which was below average. As of January 1st, with 75 inches of depth, Flattop Mountain SNOTEL has the deepest snowpack in the state. Overall the snowpack in the basin is currently above normal.

St. Mary-Milk River Basin Data Summary

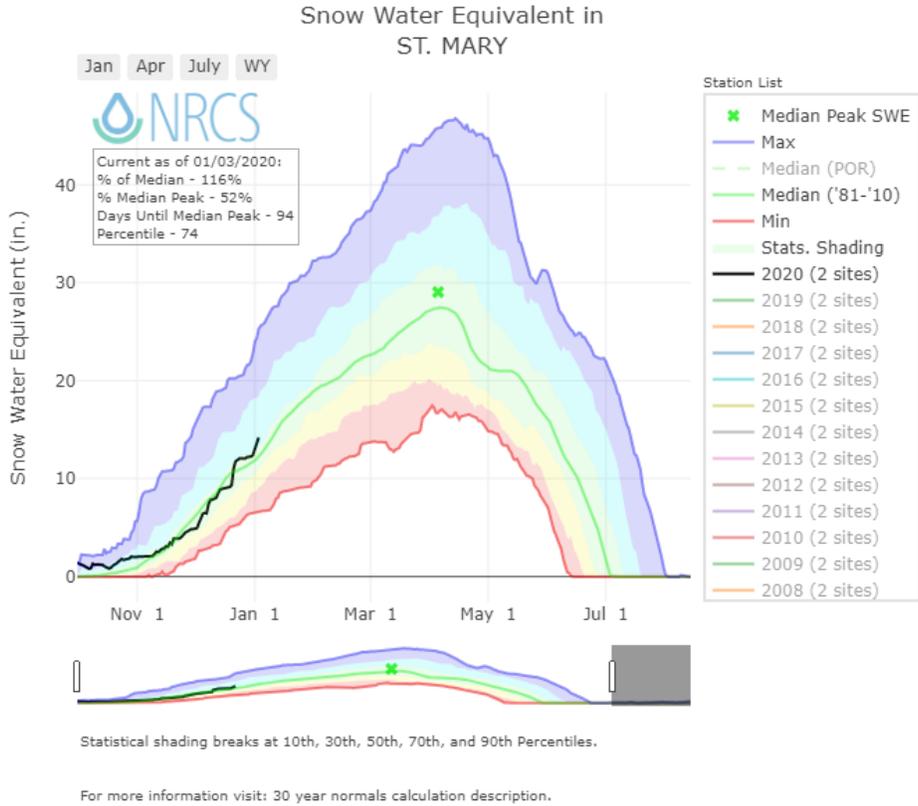
<i>Snowpack</i>	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
<i>ST. MARY</i>	110%	84%
<i>BEARPAW MOUNTAINS</i>	145%	170%
<i>MILK RIVER BASIN</i>	145%	170%
Basin-Wide	113%	91%

<i>Precipitation</i>	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation (St. Mary)	142%	95%	84%
Mountain Precipitation (Bearpaw Mtns)	76%	135%	173%
Valley Precipitation	70%	103%	108%
Basin-Wide Precipitation	131%	100%	96%

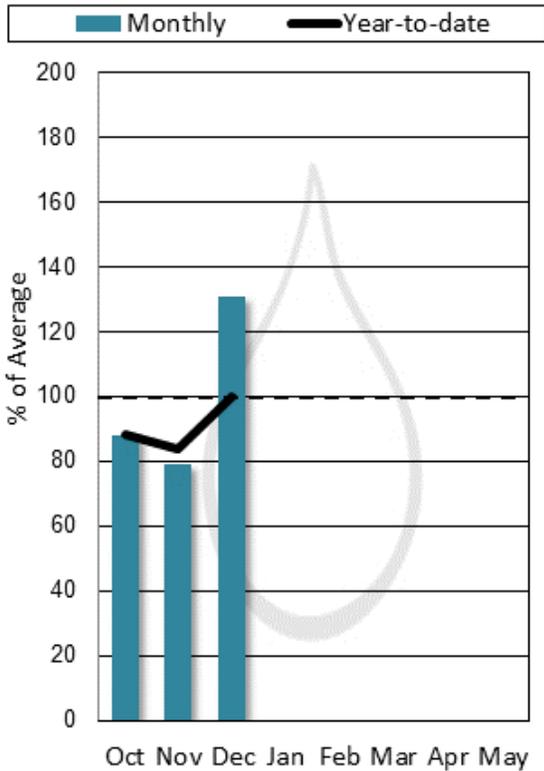
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

<i>Reservoir Storage</i>	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	153%	60%	122%

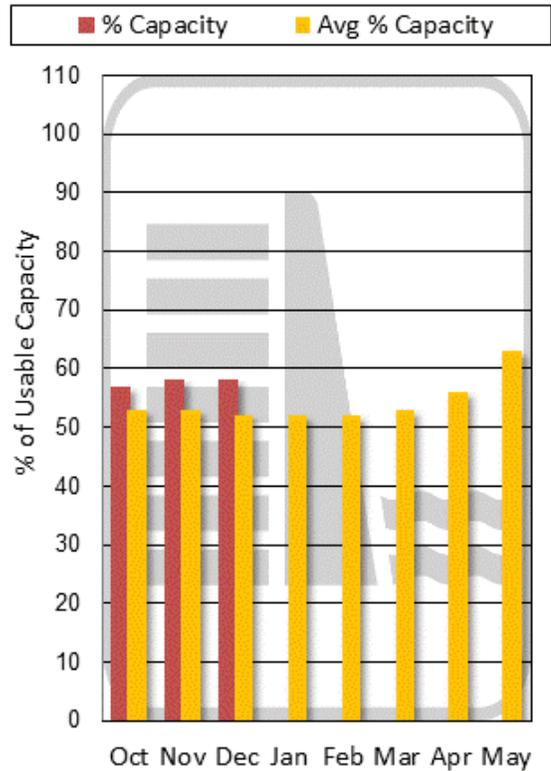
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.



Upper Yellowstone River Basin

Elevations above 8,000 feet in the Upper Yellowstone basins began the 2020 water year with snow on the ground, thanks to an early-season storm that blew through the last weekend in September. This trend continued into October with well above normal snow accumulation for the month, at all elevations. Unfortunately, the snowy weather patterns did not persist, and November registered as warm and dry across the region. Snow accumulation in the headwaters of the Upper Yellowstone in Yellowstone National Park and the Shields River basin was unusually sparse for November with SNOTEL sites recording around 50% of normal. Most of the snow received in November was thanks to a significant system that passed through at the very end of the month. From [November 26 to December 1](#), SNOTEL sites in the basin recorded 0.5 inches to 1.4 inches of snow water equivalent. This storm boosted December 1 snowpack percentages back up to normal in for the Shields River Basin and above normal for the Yellowstone Headwaters, Boulder, Stillwater, and Clarks Fork sub-basins. December brought a return to mild weather and below normal snow accumulation, though not quite as dry as November. As the calendar year ended, more favorable weather patterns would return to the region, with many SNOTEL sites across the basin receiving snowfall as this report is published. Storm totals will be summarized in next month's report. As of January 1, all sub-basins of the Upper Yellowstone are sitting at near normal to slightly above normal as far as snowpack is concerned, except for the Shields River basin, which is just 76% of normal.

Upper Yellowstone River Basin Data Summary

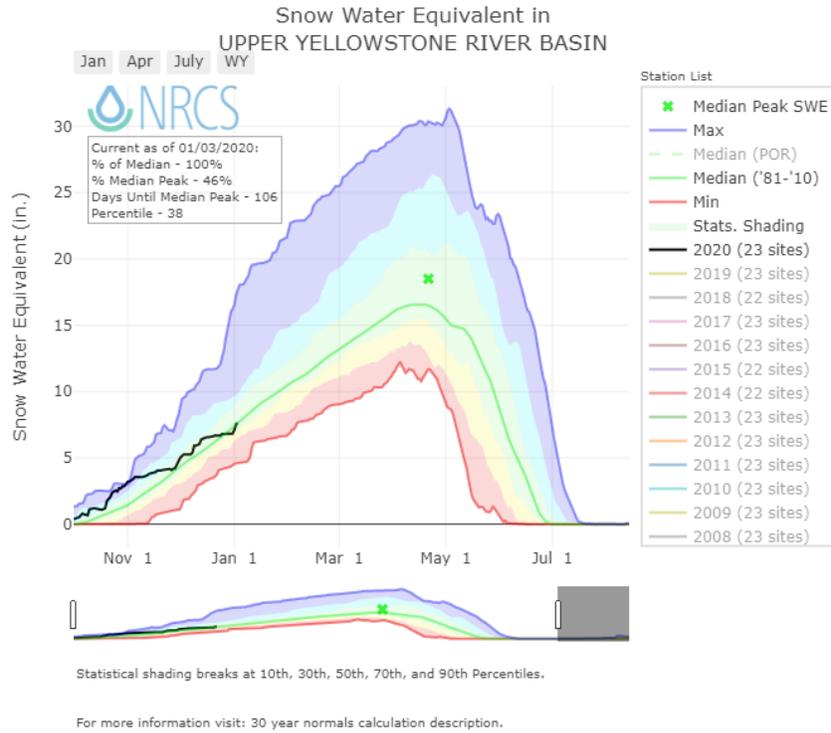
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
<i>YELLOWSTONE ab LIVINGSTON</i>	94%	89%
<i>SHIELDS</i>	76%	119%
<i>BOULDER-STILLWATER</i>	107%	98%
<i>RED LODGE-ROCK CREEK</i>	109%	135%
<i>CLARK'S FORK</i>	98%	86%
Basin-Wide Snowpack	95%	96%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	68%	87%	102%
Valley Precipitation	20%	98%	104%
Basin-Wide Precipitation	65%	88%	102%

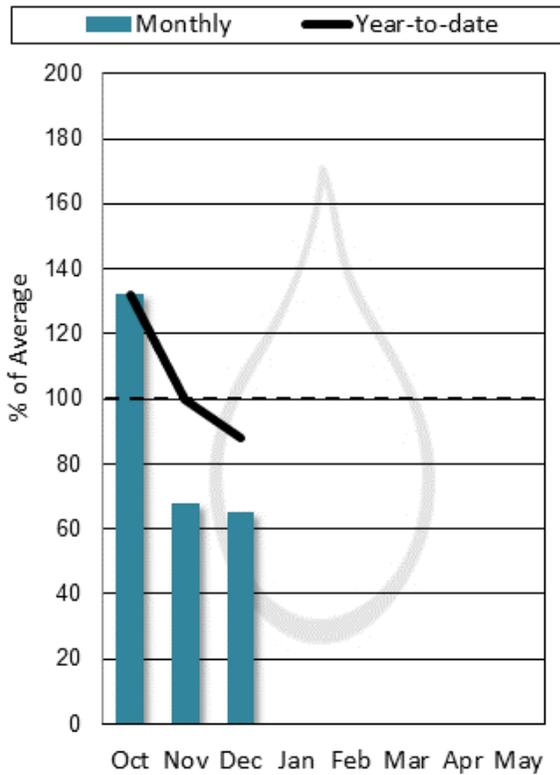
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	126%	64%	116%

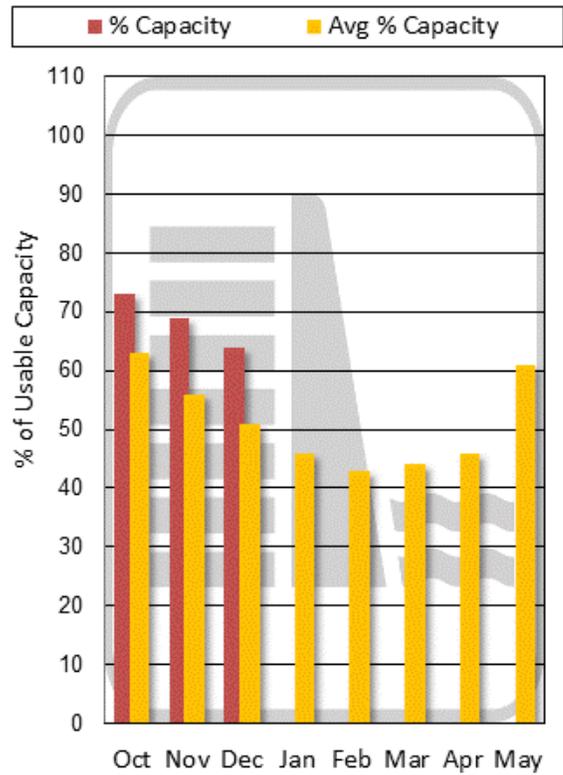
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Lower Yellowstone River Basin



An early season storm system passed through the last few days of September, leaving seasonally significant snow accumulation on the ground in the higher elevations of the Big Horn basin. Snowpack percentages on October 1 were well above average at SNOTEL sites on the east and west sides of the Big Horn basin as we kicked off water year 2020. Snow accumulation continued to be well above normal in October for most of the Lower Yellowstone region. Many SNOTEL sites in the Shoshone, Big Horn, Powder & Tongue river basins recorded 1.5” to 3” of snow water equivalent during the last two weeks of the month. Unfortunately, this wet and cold pattern did not stick around for November; while the Powder and Tongue basins received normal accumulation during the month, the western portion of the region experienced below normal precipitation. Snowpack percentages on December 1 would have been pretty dire in the Shoshone, Wind River & west side of the Big Horn basins but were saved by significant snow accumulation the last few days of November. Sites in the Wind River experienced [totals that ranged from 1.4 to 2.0 inches of Snow Water Equivalent \(SWE\) between November 25 to December 1](#). December was a similar story to November with very little snow accumulation until the end of the month. The New Year storm boosted totals a bit, but for conditions to remain favorable for runoff, winter needs to kick it up a little in the coming months. As of January 1, snowpack totals for the basins of the Lower Yellowstone were near to slightly above normal, and above last year for this date.

Lower Yellowstone River Basin Data Summary

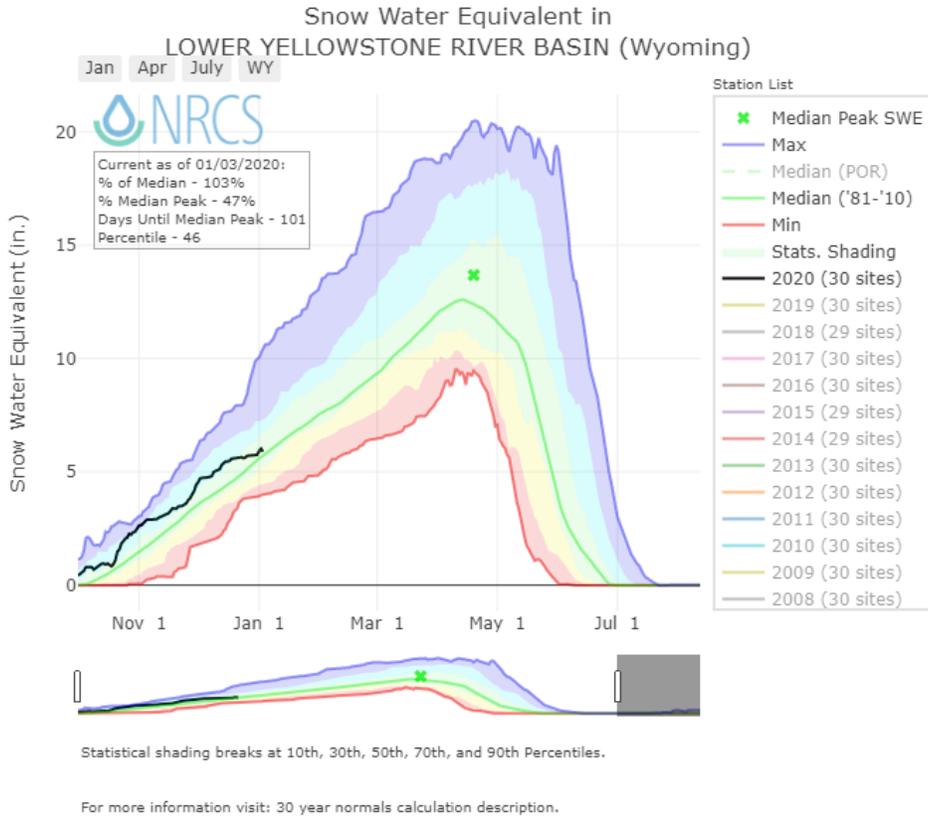
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
WIND RIVER BASIN	97%	78%
SHOSHONE RIVER BASIN	94%	96%
BIGHORN RIVER BASIN	111%	100%
LITTLE BIGHORN BASIN	117%	102%
TONGUE RIVER BASIN	107%	92%
POWDER RIVER BASIN	128%	103%
Basin-Wide Snowpack	106%	92%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	63%	87%	88%
Valley Precipitation	52%	96%	109%
Basin-Wide Precipitation	61%	90%	94%

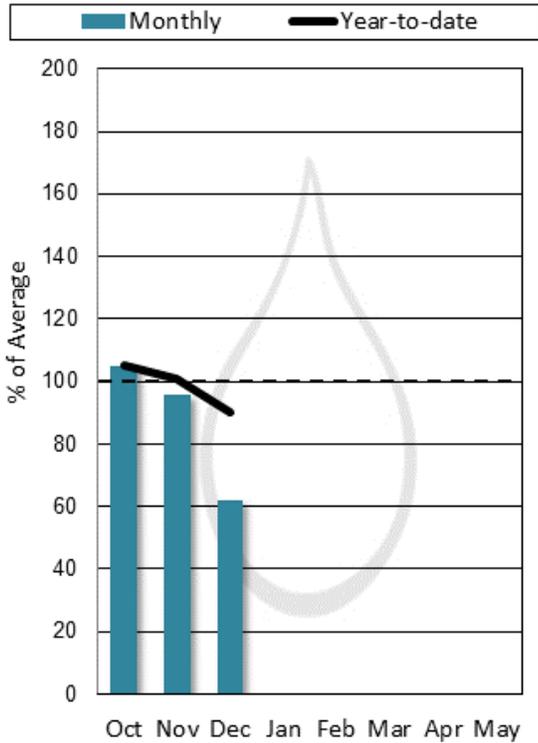
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	109%	68%	103%

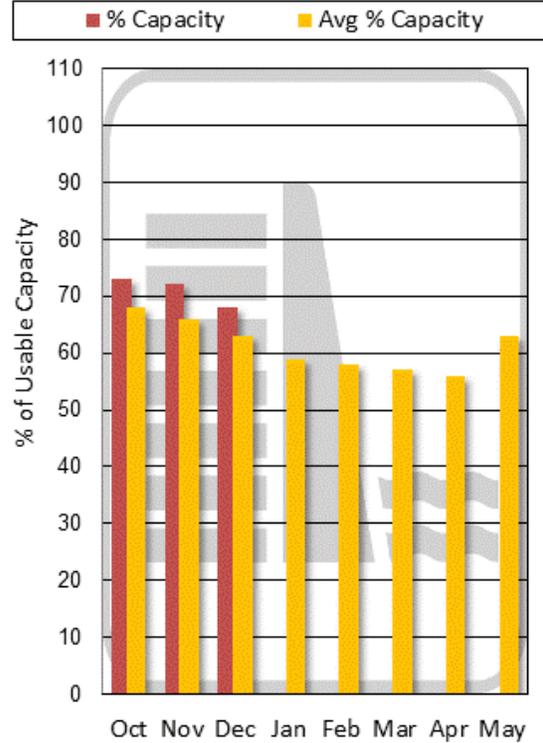
(click to navigate to [online version](#) with additional features)



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

Issued by:

Matt Lohr
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by:

Tom Watson
State Conservationist
Natural Resources Conservation Service
Bozeman, Montana

Report Created by:

Montana Snow Survey Staff
10 East Babcock St, Room 443
Bozeman, MT 59715
Email: MT-nrcs-snow@one.usda.gov



Montana
Water Supply Outlook
Report
Natural Resources Conservation Service

